

---

# THE GENERA *CESTRUM* AND *SESSEA* (SOLANACEAE: CESTREAE) IN VENEZUELA<sup>1</sup>

Carmen Benítez de Rojas<sup>2</sup> and  
William G. D'Arcy<sup>3</sup>

---

## ABSTRACT

Solanaceae, tribe Cestreae, is represented in Venezuela by the two genera *Cestrum* (31 species) and *Sessea* (1 species). This treatment distinguishes the genera and their species by dichotomous keys. All species are provided with descriptions, illustrations, distribution maps, and notes on their appearances, phenology, and geographical ranges. A list of specimens seen that were made in Venezuela is also provided.

---

Tribe Cestreae of the Solanaceae is represented in Venezuela by two genera, *Cestrum* L. and *Sessea* Ruiz & Pav. Plants of the tribe are shrubs, trees, and vines with entire leaves, and the flowers have tubular corollas that are long-exserted from small calyces. The flowers of *Cestrum* and *Sessea* are so similar that the genera usually cannot be distinguished without fruit. *Cestrum* has a juicy berry and more or less prismatic seeds, while *Sessea* has a dehiscent capsule with winged seeds.

This paper, based on field, herbarium, and greenhouse studies, revises the Venezuelan species in the two genera. A summary of the work with statistics on ranges, ecology, and other relationships is being published elsewhere (Benítez & D'Arcy, in press). Photographs of representative species (Figs. 1, 2) and line drawings and distribution maps for all species (Figs. 3–62) are provided. Data for specimens cited in this paper and that support statements about distribution outside of Venezuela have been entered into TROPICOS, the Missouri Botanical Garden computer database of scientific information, where they may be accessed via the Internet at <http://mobot.org/pick/search/pick.html>.

## SYSTEMATICS

Tribe Cestreae embraces plants with near-actinomorphic flowers, small, persistent calyces, long, narrowly tubular corollas, small, longitudinally dehiscent anthers held near the corolla mouth, and

superior ovaries. The tribe includes three closely related genera, *Cestrum* (150 species), *Sessea* (25 species), and *Vestia* Willd. (1 species), and two more distant monospecific genera, *Metternichia* Mikán (eastern coastal Brazil), and *Tsoala* Bosser & D'Arcy (Madagascar). *Cestrum* ranges from northern Mexico and southern Florida to southern Chile. *Sessea* is restricted to tropical South America except for a dubious record from Hispaniola, and its diversity is centered in Andean regions, especially Ecuador. *Vestia* is restricted to south-central Chile. It has flowers similar to those of *Cestrum* and *Sessea* but much larger and a capsular fruit with more or less prismatic seeds. The tribe is a member of subfamily Cestroideae, which in recent phylogenetic schemes (Olmstead & Palmer, 1992; Olmstead et al., in press) is basal to the other subfamily, Solanoideae. *Cestrum* was revised for Venezuela by Pittier in 1932 and in its entirety by Francey in 1935–1936, who recognized 257 species. Within *Cestrum*, a section *Habrothamnus* has been recognized, which encompasses a small suite of showy species ranging from Mexico to Nicaragua, but the remainder of the genus (sect. *Cestrum*) is still undivided. *Sessea* was revised by Bitter (1922), who divided the genus into series. It was revised again by Francey (1934), who ignored the series of Bitter and recognized 23 species. D'Arcy (1979) suggested that *Sessea* may not have nearly as many as 23 species.

---

<sup>1</sup> This study was conducted with binational support, and we thankfully acknowledge funding from the Consejo Nacional de Investigaciones Científicas y Tecnológicas (CONICIT PI-56) of Venezuela and the National Science Foundation (INT-9116039) of the U.S.A. Many herbaria made their facilities available or sent specimens on loan for our study, and we gratefully acknowledge their assistance. Thanks are offered to Bruno Manara, who graciously prepared our illustrations, Richard C. Keating (Missouri Botanical Garden) for photographic assistance, and C. E. Freeman, University of Texas, El Paso, who provided sugar analyses of *Cestrum* nectars. Francisco Rojas lent invaluable support to many parts of the project, including an especially good eye for locating *Cestrum* plants from moving vehicles.

<sup>2</sup> Facultad Agronomía, Universidad Central de Venezuela, Maracay, Apartado Correos 4579, Aragua, Venezuela.

<sup>3</sup> Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166, U.S.A.



Figure 1. Selected *Cestrum* species.—A. *Cestrum petiolare*. Inflorescence on branch (after D'Arcy 18235).—B. *Cestrum bigibbosum*. Fruits on an arching branch (after Benitez 50833).

#### DESCRIPTIVE NOTES

Most Venezuelan species of *Cestreae* are shrubs or small trees, but some (*Cestrum humboldtii*, *C. lindeni*, *C. microcalyx*, *C. racemosum*) become large trees, and three (*C. scandens*, *S. strigilatum*, *C. reflexum*) are scrambling or twining vines. Most species coppice readily and root at the nodes when the stems are cut off, thus altering the growth form from a tree with a single trunk to a many-stemmed shrub.

The leaves of *Solanaceae* are estipulate, but those of *Cestreae* are often paired, a normal "major" leaf accompanied by a much smaller, often sessile "minor" leaf, a condition sometimes suggestive of stipules (Fig. 57, *Cestrum tomentosum*). An interpretation of the minor leaves of *Cestreae* as homologous with those in subfamily *Solanoideae* (see Eichler, 1875; Danert, 1958) seems reasonable, but morphological study to verify such homology is desirable. Minor leaves are more commonly present on seedlings and turions and are caducous in many species. They are a conspicuous and useful taxonomic character in some species (*C. mariquitense*, *C. petiolare*, *C. tomentosum*, *C. humboldtii*). Leaves are often malodorous, even when not bruised.

The inflorescences of *Cestreae* are mostly sev-

eral- to many-flowered clusters among the foliage of ascending branches, but in a few species such as *C. megalophyllum*, they are more or less cauliflorous in the axils of shoots on the main stem or trunk. Bracts are commonly present, often in a series grading from normal leaves to small structures subtending branches of the inflorescence or individual flowers. In addition, a small, linear, and often caducous bract termed a bracteole subtends each pedicel. Pedicels, which usually appear to be basal contractions of the calyx, sometimes extend several millimeters down to the subtending bracteole, but in many species they are obsolete, so that the calyx is sessile in the axil of the bracteole, and sometimes on the peduncle or inflorescence branch: in many cases, where there is no peduncle or stalk below the bracteole, flowers are termed sessile, even when a short pedicel is present above the bracteole. [In this sense, the term sessile means lacking a stalk below the bracteole.]

The flowers of *Cestrum* and *Sessea* all have tubular corollas exerted from small calyces. The flowers of most Venezuelan *Cestreae* species open in the evening or at night and are closed during the day. When open, the corolla lobes spread widely or are reflexed (Fig. 2A, B), and a sweet fra-

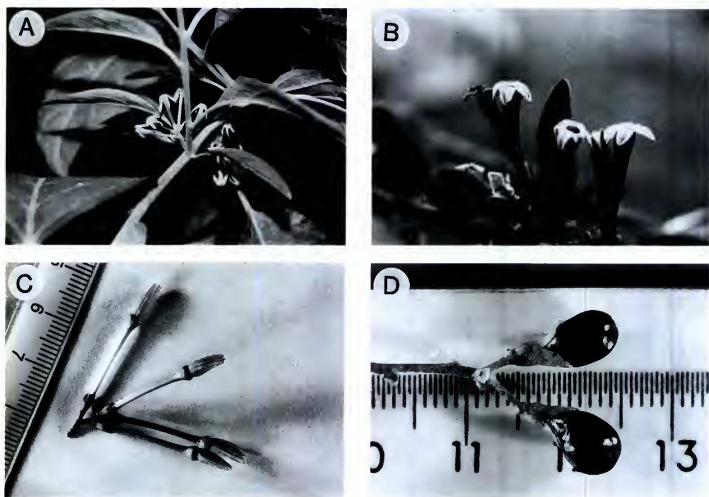


Figure 2. Selected *Cestrum* species.—A. *Cestrum latifolium*. Night view of inflorescence (Benítez 5079).—B. *Cestrum buxifolium*. Flowers, midday view, greenhouse plant (D'Arcy 18236).—C. *Cestrum alternifolium*. Flowers, daytime view, greenhouse plant (D'Arcy 18206). Note expansion at top of corolla tube.—D. *Cestrum tomentosum*. Fruits, greenhouse plant (D'Arcy 17838).

grance is emitted. In these species, thin, mostly pubescent, marginal tissue between the corolla lobes folds out of sight during the day (Fig. 2C).

The calyces of Venezuelan *Cestreae* are usually apically pubescent with the margins ciliate and the tips "tufted." They may have other pubescence as well. Corollas are mostly inconspicuous greenish, yellowish, or whitish, and nocturnal or crepuscular in opening, but in some species they are showy with bright red, orange, or other colors and open during the day. In Venezuela, only *C. lindenii* and *C. diurnum* have showy corollas, the first of these bright yellow and purple, and the second bright white. Red, blue, purple, and pink flowers, found in species of *Cestrum* in other areas, are absent from the suite of species occurring in Venezuela, although some species have violet or purplish markings on otherwise whitish or yellowish corollas.

The corollas of *Cestreae* are inserted about half-way up the height of the ovary, but the distance between the point of corolla insertion and the base of the calyx, either the cupular portion or the narrowed, pedicel-like portion, varies between species.

In this treatment, corolla length refers to the distance between the point of corolla insertion and the tip of the corolla lobes, a measurement that requires dissection of the flower. Flower length refers to the distance from the bracteole (base of the pedicel) to the tip of the corolla lobes, a measurement that can be made without dissection.

The stamens are of similar but usually slightly unequal lengths, and anthers are clustered just inside the corolla mouth. Pubescence, size, and shape of the filaments are of taxonomic utility. Filaments are adnate to the corolla tube for different distances from the corolla insertion and are often evident as raised areas along the corolla interior. The 0.5–1.5-mm-long tumid region where the filament is inserted in the corolla tube is termed the insertion. In some species, the insertion is not adnate to the corolla tube for its entire length, but is free in its distal part. In some species the insertion is associated with umbos or teeth, and when the filament departs abruptly from the corolla wall, it is termed geniculate. Above the insertion, the filament is glabrous, slender, and of roughly uniform

diameter except at the apex, where it narrows into a neck that supports the versatile anther.

In Venezuelan members of *Cestreae*, the stigma is usually situated within the corolla mouth and above the anthers, but in *Cestrum diurnum* and *Sessea corymbiflora* it is exerted from the corolla. In *Sessea*, the stigmas of the species examined are positioned laterally or obliquely on the style (Fig. 61H), while in *Cestrum* and *Vestia* the stigmatic surface is apical. If this oblique stigma is constant in other species of *Sessea*, it may serve in addition to characters of the fruit to separate *Sessea* from the other two genera. Most species of *Cestrum* have fewer than 16 ovules and many have 8 or fewer, but *C. petiolare* is unusual in the genus in having as many as 32 ovules. Seed number varies with species and in individual fruits, and the size and shape of seeds appear to depend on seed number, 1- and 2-seeded fruits bearing larger seeds. Seed shape is variable, seemingly depending on the position of neighboring seeds in the berry. In some species, such as *C. diurnum*, the placental area remains juicy long after the mesocarp is dry, providing a moisture reward to dispersers over an extended period. Fruits of most native Venezuelan species have dark and juicy or fleshy mesocarp, but *C. diurnum* and a number of species in Central America have white fruits with spongy mesocarp.

#### POLLINATION AND DISPERSAL

The factors selecting for morphological diversity in *Cestrum* are largely unknown. In Mexico, red- and yellow-flowered and red-fruited species appear to be associated with hummingbird pollination (D'Arcy, in press), and this syndrome may also be represented in the bright yellow-flowered *C. petiolare* in Venezuela. Flowers of most other species open at dawn or dusk or at night, and are sweet-scented. Many species bloom sporadically, producing few or many blossoms over a short period and then, after weeks or months, producing another flush of blooms. In some species, such as *C. latifolium* and *C. alternifolium*, plants are "mass-bloomers," producing a display of hundreds of flowers lasting only one or two days. In greenhouse plants we found that flowers of *C. alternifolium*, *C. latifolium*, *C. mariquitense*, *C. megalophyllum*, *C. racemosum*, and *C. strigilatum* had undetectable amounts of nectar. Nectars produced by other species vary greatly in sugar concentration and composition. Nectar content was reported by Percival (1965) and Bernardello et al. (1994), and we studied eight different greenhouse-grown species. Nectars in our eight species had concentrations ranging from 11% to 40%. Nectars in most species were sucrose-dominant, but

some had more fructose than sucrose. In nectar of the yellow-flowered *C. corymbosum* Schltdl., which was characterized as hummingbird pollinated, Gottsberger et al. (1984) reported a content of amino acids. Bernardello et al. (1994) recorded phenols, lipids, and amino acids in nectar from *Cestrum* cf. *bracteatum* Link & Otto. Thus, while some data have been reported about *Cestreae* nectar, the picture is still poorly sketched.

Overland (1960) studied the temporal opening and closing of flowers of *Cestrum nocturnum* and found that these movements are independent of light but are affected by temperature. She reported that scent emanates from the tips of the corolla lobes.

Actual pollinator observations have been published for only one species, *Cestrum alternifolium*. In Costa Rica, Haber and Frankie (1989) and White et al. (1994) examined pollination of *C. alternifolium* by hawkmoths (Sphingidae), which are night-flying insects commonly attracted to white flowers with strong fragrance. Similarities of many other species of *Cestrum* suggest that they, too, are sphingid pollinated. Hummingbirds and sphingids are characterized as being drawn to plants with sucrose-dominant nectars (Procter et al., 1996) such as those in *Cestrum*, which might facilitate shifts between or sharing by these pollinators in flowers such as those of *C. petiolare* and *C. aurantiacum*, where the corolla mouth is large enough to permit access by hummingbirds.

Fruits of *Cestrum* are mostly juicy berries presumably dispersed by birds, but bat dispersal cannot be ruled out. Bat dispersal of fruits and seeds reported for several species with strongly foetid foliage, e.g., *Solanum* sect. *Brevantherum* (Fleming, 1988) and *Cleome* (Ruiz Zapata, 1993), may be enhanced by the odor of the leaves. Thus, species of *Cestrum* with foetid foliage and more or less leathery fruits (*C. glabrescens*?) may be suspected of attracting bats to disperse their fruits.

#### USES AND TOXICITY

A few species of *Cestrum*, none native to Venezuela, are cultivated for ornament. *Cestrum nocturnum* is grown for the evening fragrance of its flowers, and *C. aurantiacum* for its showy orange-yellow flowers. *Cestrum racemosum* is sometimes cultivated as a city park tree. The fruit pulp of *Cestrum buxifolium* is used as writing ink.

The Solanaceae are well known for having a wide array of alkaloids (Romeike, 1978), and species of *Cestrum* have been implicated in more than one toxicity system. One system mimics vitamin D attributes

and influences calcium uptake (Prema & Raghuramulu, 1994), leading to a condition referred to as calcinosis (Wasserman, 1978). Thus, *C. diurnum*, occasionally cultivated in Venezuela, has been implicated in fatal poisoning of horses in Florida (Krook et al., 1975). This toxicity is also found in *Solanum glaucophyllum* Desv. (*S. malacoxylon* Sendtn.) in Brazil, producing an illness called "enteque seco" (Wasserman, 1974). Another system involving liver poisoning has killed cattle in other countries (Atkinson & James, 1979; McLennan & Kelly, 1984) and must be suspected in *Cestrum* species growing in Venezuela. Most reports of hepatic toxins involve *Cestrum parqui* L'Her., an Argentine species now naturalized in South Africa and Australia, but herbarium labels and at least one published report (Atkinson & James, 1979) indicate similar properties in red-flowered species in Central America. These hepatotoxic species have relatively large showy flowers like those of *C. lindeni* or *C. petiolare* in Venezuela, suggesting the possibility that these too may have toxic properties. *Cestrum acuminatissimum* is used in Venezuela for stunning fish.

Much of what is known about the toxicity and biology of *Cestrum* may apply also to *Sessea*. One relevant investigation was carried out by Andrade (1960).

#### CYTOLOGY

Cytological reports (cited below under species descriptions) for a number of species of *Cestrum* indicate that a chromosome number of  $n = 8$  is general in the genus. Numbers other than  $n = 8$  or  $2n = 16$  have been reported for some cultivated species. A chromosome number of  $n = 8$  has also been reported for *Vestia*, but no chromosome data are known for *Sessea*. The numbers  $n = 8$ ,  $2n = 16$  in Cestreae contrast with the prevailing number in subfamily Solanoideae of  $n = 12$ ,  $2n = 24$ , suggesting a significant taxonomic gap.

Berg and Greilhuber (1992, 1993a, 1993b) noted that chromosomes of *Cestrum* are unusual in flowering plants in having cold-sensitive regions. The functional or adaptive roles of these regions are not understood, but variation was found in the five species they studied.

#### MATERIALS AND METHODS

Fieldwork comprised three extended trips with students and other helpers covering most parts of Venezuela, and many shorter, less directed trips to various parts of the country. Specimens were studied from herbaria in Venezuela: CAR, CORO, GUYN, IRBR, MER, MERC, MERF, MY, MYF, PORT, TFAV, UCOB, VEN, and VZU; and in other

countries: BM, BR, CM, CORD, F, G, GH, HBG, K, LINN, MA, MO, NY, P, US, W, and WIS. Many species were grown in the St. Louis greenhouse over several years for day and night examination of flowering behavior and as a source of plant parts to examine in the laboratory. Specimens were examined under stereoscopic microscopes in Maracay, St. Louis, and other places. Nectar sugar ratios were obtained by C. E. Freeman (pers. comm.) using the protocol outlined in Freeman et al. (1984).

#### TAXONOMIC TREATMENT

**Cestreae** ("Cestrineae") G. Don, Gen. Hist. 4(2): 400. 1838. TYPE: *Cestrum* L.

Unarmed shrubs, trees, or vines; pubescence of simple, branched, or stellate, sometimes glandular hairs. Leaves simple, entire, minor leaves sometimes present. Inflorescences variously branched panicles or racemes, often with bracts, the flowers mostly subtended by a small bracteole. Flowers mostly 5-merous, calyx cupular or tubular, lobed less than halfway; corolla tubular or funnelliform with 5 short, usually spreading lobes; stamens inserted in the corolla tube, anthers opening lengthwise; ovary superior, often basally differentiated into a nectariferous disk and sometimes short-stipitate; locules 2, stigma positioned near the anthers, ovules 4–20(–37). Fruit a juicy berry or an apically dehiscent capsule. Seeds of various shape, sometimes winged; embryo straight. In Venezuela 2 genera: *Cestrum* and *Sessea*.

#### KEY TO GENERA (*CESTRUM* AND *SESSEA* OF TRIBE CESTREAE IN VENEZUELA)

- 1a. Fruit a berry; seeds unwinged ..... *Cestrum*  
1b. Fruit a capsule; seeds winged ..... *Sessea*

***Cestrum* L.**, Sp. Pl. 191. 1753; Gen. Pl., ed. 5. 88. 1754. TYPE: *Cestrum nocturnum* L.

*Parqui* Adans., Fam. Pl. 2: 219. 1763. *Parquis* Raf., Sylva Tellur. 56. 1838. TYPE: *Alkekengi* Feuillée (= *Cestrum hedjundum* Lam.).

*Meyenia* Schldtl., Linnaea 8: 251. 1833, not *Meyenia* Nees, in Wall. (1832), Acanthaceae. *Habrothamnus* Endl., Gen. Pl. 667. 1839. TYPE: *Meyenia fasciculata* Schldtl. (= *Cestrum fasciculatum* (Schldtl.) Miers).

*Lomeria* Raf., Sylva Tellur. 56. 1838. TYPE: *Lomeria purpurea* Raf. (= *Cestrum longiflorum* Ruiz & Pav.).

*Wadea* Raf., Sylva Tellur. 56. 1838. TYPE: *Wadea latifolia* Raf. (= *Cestrum latifolium* Lam.).

Unarmed shrubs, trees, or rarely vines; pubescence of simple, branched, or stellate hairs, sometimes glandular. Leaves simple, entire, pinnately nerved, mostly glabrate above; mostly short-petio-

late; minor leaves present or not. Inflorescences axillary and pseudoterminal, few- or many-flowered racemes, spikes or cymes, often large and appearing paniculate; bracts often present. Flowers diurnal or nocturnal, mostly fragrant, mostly 5-merous, pedicellate, bracteolate; calyx small, cupular or tubular, mostly shallowly lobed; corolla narrowly tubular, much exceeding the calyx, lobed, the lobes narrow, shorter than the tube, spreading or reflexed when open; stamens inserted in the corolla tube at similar levels, the insertion levels varying greatly in different species, the adnate portion mostly evident from the corolla base, the insertion variously pubescent, tumid, or denticulate, anthers small,

mostly situated together at the corolla mouth; ovary mostly shorter than the calyx, 2-locular, ovules (1-) 4-16(-32), style slender, mostly puberulent or papillose near the apex, style capitate or variously lobed, small, sometimes exerted beyond the anthers or corolla mouth. Fruit blackish, purplish, red, or white, an ovoid, ellipsoidal or obovoid, juicy or fleshy berry; fruiting calyx sometimes accrescent and splitting; seeds varying in number, variable in shape, even in the same berry, embryo straight.

References to the last revision of the entire genus by Francey (1935-1936) are found in brackets at the end of descriptions in the following accounts of the Venezuelan species.

KEY TO SPECIES OF *CESTRUM* AND *SESSEA* IN VENEZUELA

- 1a. Mature leaves pubescent beneath.
- 2a. Leaf undersides sparingly pubescent or glabrate with minute simple hairs; calyx mostly glabrous outside.
- 3a. Leaves subcoriaceous and rigid; corolla tube stout, > 1 mm wide from near the calyx; flowers apparently open during the day ..... *Cestrum tubulosum*
- 3b. Leaves membranous, flexuous; corolla slender, < 1 mm wide to more than halfway up; flowers closed during most of the day.
- 4a. Flowers subumbellate on leafy (bracteate) shoots, few per inflorescence, > 20 mm long; calyx  $\geq$  2.5 mm long; corolla > 25 mm long; fruit mostly  $\geq$  10 mm long ..... *Cestrum alternifolium*
- 4b. Flowers in short, leafless racemes or spikes,  $\leq$  20 mm long; calyx < 2.5 mm long; corolla < 22 mm long; fruit mostly  $\leq$  10 mm long ..... *Cestrum latifolium*
- 2b. Leaf undersides copiously pubescent with simple or branched hairs; calyx pubescent outside.
- 5a. Flowers  $\geq$  25 mm long; corolla pubescent outside; calyx > 6 mm long; minor leaves wanting.
- 6a. Calyx teeth cuspidate/apiculate, > 3 mm long; corolla 2.5 mm across at the mouth; filaments unexpanded and straight at insertion area ..... *Cestrum strigilatum*
- 6b. Calyx teeth blunt, < 2 mm long; corolla 3-3.5 mm across at the mouth; filaments tumid and geniculate at insertion area ..... *Cestrum olivaceum*
- 5b. Flowers  $\leq$  25 mm long; corolla glabrous outside; calyx < 6 mm long; minor leaves present.
- 7a. Leaves drying dark with floccose to evenly distributed whitish pubescence; leaves mostly with > 12 veins on each side; calyx lobes < 1.5 mm long ..... *Cestrum humboldtii*
- 7b. Leaves drying green or brown with evenly distributed yellowish or brownish pubescence; leaves mostly with < 12 veins on each side; calyx lobes > 1.5 mm long ..... *Cestrum tomentosum*
- 1b. Mature leaves glabrate beneath.
- 8a. Leaves with  $\geq$  10 pairs of lateral nerves.
- 9a. Calyx > 7 mm long; minor leaves conspicuous ..... *Cestrum petiolare*
- 9b. Calyx < 7 mm long; minor leaves wanting.
- 10a. Leaves with the veins drying salient beneath, half or more as wide as long; petioles of mature leaves mostly > 12 mm long; inflorescences held erect or nodding; trees.
- 11a. Inflorescences terminal; peduncles sturdy; calyx > 4 mm long; corolla mouth > 2 mm wide; fruit a dehiscent capsule; plants found above 2100 m ..... *Sessea corymbiflora*
- 11b. Inflorescences mostly axillary along leafy stems; peduncles slender; calyx < 3.5 mm long, corolla mouth < 2 mm wide; fruit a juicy berry; plants found below 2100 m.
- 12a. Inflorescences spicate; filament insertion geniculate and tumid; leaf bases mostly cuneate ..... *Cestrum cuneifolium*
- 12b. Inflorescences racemose; filaments straight and unthickened; leaf bases mostly rounded.
- 13a. Corolla 13-18 mm long; fruit globose; petioles often drying dark, especially at the base ..... *Cestrum racemosum*
- 13b. Corolla 26-31 mm long; fruit ellipsoidal; petiole bases mostly drying light-colored.
- 14a. Leaves with veins ascending at < 70°; stamens pubescent just below the insertion; corolla mouth 2.5 mm across ..... *Cestrum acuminatissimum*
- 14b. Leaves with veins strongly ascending at > 70°; stamens glabrous near the insertion; corolla mouth 3.5 mm across ..... *Cestrum schulzianum*

- 10b. Leaves with veins drying  $\pm$  plane beneath; leaves broad or narrow, diminishing in size toward the terminal inflorescences, often much narrower than half their length; petioles mostly  $< 12$  mm long; inflorescences arching and dangling; slender, willowy treelets.
- 15a. Flowers pedicellate (bracteole along the length of flower stalk); peduncle 1-flowered; leaves narrow with  $> 15$  lateral veins on each side ..... *Cestrum salicifolium*
- 15b. Flowers sessile (bracteole immediately beneath calyx); peduncle 2-3-flowered; leaves narrow or broad with  $< 15$  lateral veins on each side ..... *Cestrum bigibbosum*
- 8b. Leaves with  $\leq 10$  pairs of lateral nerves.
- 16a. Flowering calyx  $\leq 3.5$  mm long; free portion of filaments  $\leq 5$  mm.
- 17a. Corolla  $> 20$  mm long.
- 18a. Minor leaves persistent, often conspicuous; leaves  $< 4$  cm wide ... *Cestrum mariquitense*
- 18b. Minor leaves wanting on mature growth; leaves wide or narrow.
- 19a. Flowers subtended by bracts or bracteoles  $> 6$  mm long ( $> 3$  mm wide).
- 20a. Bracts not folded, not enclosing flowers; inflorescences stalked clusters on a terminal, elongate central axis; climbing shrub ..... *Cestrum reflexum*
- 20b. A bract or bracteole longitudinally folded and half enclosing the basal part of the flower; inflorescences stalked clusters, terminal or axillary without a central axis; erect shrubs.
- 21a. Enveloping bract half enclosing the corolla tube and the fruit, persistent; leaf bases rounded or truncate ..... *Cestrum jaramillanum*
- 21b. Enveloping bract hardly extending along the corolla tube, caducous; leaf bases cuneate ..... *Cestrum parriense*
- 19b. Flowers lacking conspicuous bracts (mostly with caducous bracteoles  $< 6$  mm long).
- 22a. Leaves  $< 2$  cm wide, much longer than wide; inflorescences few-flowered fascicles ..... *Cestrum neblinense*
- 22b. Leaves mostly  $> 2$  cm wide, if narrower, then  $< 3$  times longer than wide; inflorescences few- or many-flowered racemes.
- 23a. Climbing vines; flowers  $> 28$  mm long ..... *Cestrum scandens*
- 23b. Erect or sprawling shrubs or trees; flowers  $< 27$  mm long.
- 24a. Leaves mostly  $< 4.5$  cm wide, membranous; free portion of filaments  $> 2.5$  mm, the insertion toothed; fruit white; corolla lobes  $< 3$  mm long; widespread and cultivated species ... *Cestrum nocturnum*
- 24b. Leaves mostly  $> 5$  cm wide, often coriaceous; free portion of filaments  $< 2$  mm, the insertion smooth (untoothed); fruit purple or green?; corolla lobes  $> 3$  mm long; local endemic species.
- 25a. Filaments 1-2 mm free, glabrate; calyx lobes  $< 1$  mm long; corolla mostly  $> 23$  mm long; Amazonas endemic ..... *Cestrum glabrescens*
- 25b. Filaments 4-5 mm free, pubescent; calyx lobes 1-2 mm long; corolla mostly  $< 23$  mm long; Cordillera de la Costa endemic ..... *Cestrum potaliifolium*
- 17b. Corolla  $< 20$  mm long.
- 26a. Corolla not closing, mouth 3-3.5 mm across, the lobes recurved, rounded, bright white,  $< 1.5$  mm long ..... *Cestrum diurnum*
- 26b. Corolla mostly closed during the day, mouth  $< 1.5$  mm across, the lobes spreading or reflexed at night, straight when expanded, pointed, greenish white or purple,  $> 1.5$  mm long.
- 27a. Peduncles  $> 1$  cm long; leaves membranous, mostly drying plane, the minor venation unobtrusive, drying similar colored to other venation beneath; petioles drying as the stems (sometimes darker only at the base) ..... *Cestrum microcalyx*
- 27b. Peduncles  $< 1$  cm long; leaves coriaceous, often drying wrinkled, the costa and main veins conspicuous and salient beneath, minor venation drying whitish beneath; petioles drying dark ..... *Cestrum megalophyllum*
- 16b. Flowering calyx  $\geq 3.5$  mm long; free portion of filaments mostly  $> 5$  mm.
- 28a. Corolla  $< 25$  mm long, the lobes  $< 5$  mm long.
- 29a. Leaves  $< 3$  cm wide; corolla lobes  $\leq 3$  mm long.
- 30a. Leaves mostly  $< 1$  cm wide; petioles  $\leq 3$  mm long; calyx tube glabrous; free portion of filaments 5-9 mm ..... *Cestrum buxifolium*
- 30b. Leaves mostly  $> 1$  cm wide; petioles  $\geq 3$  mm long; calyx tube puberulent; free portion of filaments 4-5 mm ..... *Cestrum tillettii*
- 29b. Leaves mostly  $> 3$  cm wide; corolla lobes mostly  $> 3$  mm long.
- 31a. Calyx  $> 5$  mm long; inflorescences terminal panicles.
- 32a. Corolla  $> 22$  mm long, the mouth  $> 3.5$  mm across; filaments glabrous,

- the insertion geniculate-tumid, lacking teeth; leaves mostly < 6 mm long and < 3 cm wide ..... *Cestrum ruizteranianum*
- 32b. Corolla < 22 mm long, the mouth < 3 mm across; filaments pubescent, the insertion hardly bent or expanded, denticulate; leaves mostly > 6 mm long and > 3 cm wide ..... *Cestrum lindeni*
- 31b. Calyx < 5 mm long; inflorescences mostly arranged along the stems, subumbellate, racemose, or spicate.
- 33a. Inflorescences at or near the end of elongate, slender, wandlike, often declining branches that bear diminishing leaves or terminal, few-flowered pedunculate or subsessile clusters; filaments pubescent ..... *Cestrum bigibbosum*
- 33b. Inflorescences mostly distributed along branches with leaves not conspicuously diminishing upward and terminal on stiff branches; filaments glabrous.
- 34a. Leaves membranous, large, often > 4 cm wide; free portion of filaments 1–2 mm; flowers < 23 mm long ..... *Cestrum glabrescens*
- 34b. Leaves coriaceous, mostly < 3 cm wide; free portion of filaments 5–9 mm; flowers > 22 mm long.
- 35a. Leaves ascending, mostly widest at or below the middle; free portion of filaments glabrous, 6–8 mm; calyx often drying darker near the apex, the nerves not darker, the teeth ca. 0.5 mm long ..... *Cestrum imbricatum*
- 35b. Leaves spreading, mostly widest at or above the middle; free portion of filaments pilose, ca. 5.5 mm; calyx drying evenly from base to apex, the teeth ca. 1 mm long ..... *Cestrum cuneifolium*
- 28b. Corolla > 25 mm long, the lobes  $\geq$  4 mm long.
- 30a. Vines or scramblers; free portion of filaments 0.5–1 mm, glabrous.
- 37a. Flowers lacking pedicels (the subtending bracteole sessile on the axis); corolla lobes < 6 mm long; plants drying dark brown or gray; twigs and inflorescences puberulent; petioles tomentose ..... *Cestrum reflexum*
- 37b. Flowers on short, distinct pedicels (below the subtending bracteole); corolla lobes > 6 mm long; plants drying greenish or yellowish; twigs and inflorescences mostly glabrous; petioles glabrate ..... *Cestrum scandens*
- 36b. Erect shrubs or trees; filaments free for various distances, glabrous or pubescent.
- 38a. Corolla showy, yellow or orange, the mouth > 5 mm across; calyx > 5 mm long; fruit white; petioles > 2 cm long; sparingly cultivated exotic species ..... *Cestrum aurantiacum*
- 38b. Corolla inconspicuous, green, yellow, or whitish purple, the mouth < 5 mm across; calyx > 5 mm long; fruit purple-black; petioles < 1 cm long; native species.
- 39a. Minor leaves abundant, often conspicuous; stamens barbate at insertion ..... *Cestrum mariquitense*
- 39b. Minor leaves wanting; stamens glabrous or pubescent but not at insertion.
- 40a. Calyx > 5 mm long; flowers and fruits half-enfolded lengthwise in a persistent leafy bract; filaments glabrous; leaves mostly < 3 mm wide ..... *Cestrum jarumillanum*
- 40b. Calyx < 5 mm long; lacking persistent bracts; filaments mostly pubescent.
- 41a. Calyx glabrous; leaves mostly > 3 mm wide.
- 42a. Corolla < 26 mm long; Andean species > 2500 m ..... *Cestrum ruizteranianum*
- 42b. Corolla > 26 mm long; Guayanan species < 500 m.
- 43a. Inflorescence axes slender, glabrate ..... *Cestrum acuminatissimum*
- 43b. Inflorescence axes stout, tomentose ..... *Cestrum tubulosum*
- 41b. Calyx puberulent.
- 44a. Corolla > 29 mm long; corolla lobes > 5 mm long; Guayanan species < 500 m ..... *Cestrum schulzianum*
- 44b. Corolla < 26 mm long; corolla lobes < 5 mm long; central Venezuela, > 1000 m ..... *Cestrum glabrescens*

1. *Cestrum acuminatissimum* Dunal, in A. DC., Prodr. 13(1): 627. 1852. TYPE: French Guiana "circa Cayennam," Leprieur s.n. (holotype, G-DC not seen, = IDC microfiche, = F photo 6907).

*Cestrum lorentense* Francey, Candollea 6: 225. 1935. TYPE:

Peru. Loreto: La Victoria on the Amazon river, Williams 3129 (holotype, F).

Shrub 1.5–3 m tall, sometimes sprawling, branches terete, striate, nodes of leaves and inflorescences thickened; pubescence of simple, monil-



iform ascending and crumpled hairs. *Leaves* narrowly ovate or elliptical, 8–16(–18) × 4–7 cm, apically short-acuminate, acute or obtuse and then forming a narrow apicule, the base narrowly cuneate, truncate or subtruncate, the margins slightly revolute, papery-coriaceous, dark green above, light green beneath, glabrous on both sides but sometimes with minute trichomes on the veins beneath, the veins impressed above, prominent beneath, ascending, 6–12 on each side; petiole 3–5(–10) mm long, the base somewhat thickened; minor leaves wanting. *Inflorescences* short axillary racemes, axes 5–10 mm long, 1.5–2 mm thick, tomentose with ascending, curved hairs; bracts 1–2.5 mm long, foliaceous, subulate, yellowish or reddish pubescent. *Flowers* apparently nocturnal, 28–32 mm long; pedicels 0.5 mm or obsolete; bracteoles narrow, tomentose; calyx tubular, 3.5–5.5 × 1.5–3 mm, the tube 3.5–5 mm long, glabrous, the teeth triangular-acute, 0.5 mm long, ciliate and tufted, the costas and lateral veins salient, the 5 costas thickened upward; corolla pale greenish yellow, 28–31 mm long, the tube narrow, very gradually expanded upward, slightly contracted at the throat, mouth 2–2.5 mm wide, the lobes narrowly acuminate, 4–7.5 mm long, sometimes sparingly pubescent, ciliate; stamens 20.5–24.5 mm long, filaments adnate for 18–22 mm, pilose to 1 mm or 8–15 mm above the base, insertion straight, smooth, free 0.5–3 mm, anthers orbicular, 0.5–0.8 mm across; ovary ellipsoidal, 1–1.5 × 1 mm, glabrous, disk conspicuous, ovules 8–10, style 20–24.5 mm long, filiform, puberulent just below the stigma, the stigma capitate, included. *Fruit* dark purple, ellipsoidal, 10–13(–16) × 6–9 mm, with a thin pericarp; fruiting calyx hardly accrescent; seeds 3–5, dark brown, 4–7 mm long. [Francey 6: 314.] Figure 3.

*Cestrum acuminatissimum* is distinguished by a number of features that tend to overlap with other species, notably *C. megalophyllum*. The longer flowers, pubescent stamen insertion, and matte appearance of the upper sides of the revolute leaves are good recognition features. The corolla is quite variable in length but is usually more than 28 mm long with the lobes 4–7.5 mm long. The inflorescence axes are notably slender.

*Distribution* (Fig. 4). Amazonas, Apure, Barinas, and Táchira. Gallery forests along riverbanks; 100 to 300 m. Also in French Guiana, Colombia, Peru, and Brazil.

*Phenology*. Collected in flower between November and March, and in fruit mostly in March and May.

*Common names and uses*. *Beecotó* (Pumé language), *Derello*, *Mecla*. Mixed with other herbs, plants are used for stunning fish (*Gragsón* & *Gragsón* 48, MY).

*Representative specimens seen*. VENEZUELA. **Amazonas**: Maroa–Yavita road, 5.5 km from Maroa port, *Clark* 6948 (MO, NY); 20 km S of confluence of Río Negro and Brazo Casiquiare, *Liesner* 6877 (MO, VEN); 4 km S de Solano, *Morillo* & *Hasegawa* 5026 (MY, VEN). **Apure**: Distrito Pedro Camejo, main road S of Paso de San Pablo to Río Cinaruco, *Dauidse* & *González* 15984 (MO, VEN); Reserva Forestal San Camilo, quebrada de El Dique, SW de San Camilo (El Nula), *Steyermark* et al. 101530 (US, VEN). **Barinas**: 5 km SW of dam site on Río Caparo, 31 km ESE of Santa Bárbara, *Liesner* & *González* 9311 (MO, VEN), 9322 (MO, VEN). **Táchira**: E of La Fundación around Represa Dorada, *Liesner* & *González* 10412 (MO, VEN); Montaña Guafitas, NW of El Piñal, *Steyermark* et al. 119545 (MO, VEN).

2. *Cestrum alternifolium* (Jacq.) O. E. Schulz, in Urb., *Symb. Antill.* 6: 270. 1909. *Ixora alternifolia* Jacq., *Enum. Syst. Pl.* 12. 1760. TYPE: Cultivated Europe, seed from Martinique, *Jacquin* s.n. (lectotype, here designated, W not seen, = F photo 33021).

*Chiococca alternifolia* L., *Syst. Nat.* ed. 12. 2: 165. 1767. Based on *Chiococca scandens sarmentis tenuissimis & fere indivisis* P. Browne, *Civ. Nat. Hist. Jamaica* 164. 1756. TYPE: not located.

*Cestrum confertum* Miller, *Gard. Dict.* ed. 8, *Cestrum* no. 5. 1768. TYPE: not indicated.

*Cestrum respertinum* L., *Mant. Pl.* 2: 206. 1771. TYPE: Hort. Upsala (holotype, LINN 258.2 not seen, = IDC microfiche).

*Cestrum pendulinum* Jacq., *Pl. Hort. Schoenbr.* 3: 42, pl. 327. 1798. *Cestrum alternifolium* var. *pendulinum* (Jacq.) O. E. Schulz, in Urb., *Symb. Antill.* 6: 272. 1909. TYPE: Venezuela. Caracas, plate 327 in *Jacquin*, 1798 (lectotype, here designated).

*Cestrum amelanchier* Dunal, in A. DC., *Prodr.* 13(1): 662. 1852. TYPE: Cultivated hort. Rothomagensi (holotype, G-DC not seen, = IDC microfiche, = F photo 6896).

*Cestrum depauperatum* Dunal, in A. DC., *Prodr.* 13(1): 660. 1852. TYPE: Guadeloupe, *Bertero* s.n. (holotype, G-DC not seen, = IDC microfiche, = F photo 33966).

*Cestrum alternifolium* var. *mithanthum* O. E. Schulz, in Urb., *Symb. Antill.* 6: 273. 1909. TYPE: Venezuela. Nueva Esparta: Margarita ad El Valle, *J. R. Johnston* 285 (holotype, GH).

*Shrub* 3–4 m tall, much branched, the branching irregular, often wand-like or pendulous, twigs green, minutely pubescent, glabrescent, the tips often sharp, mature stems often whitish or yellowish, lenticellate; pubescence of simple hairs. *Leaves* malodorous, ovate, sometimes elliptical or narrowly elliptical, (1.5–)3.7–12.5 × 1.5–4.5 cm, attenuate toward the apex, the apex itself obtuse, rounded

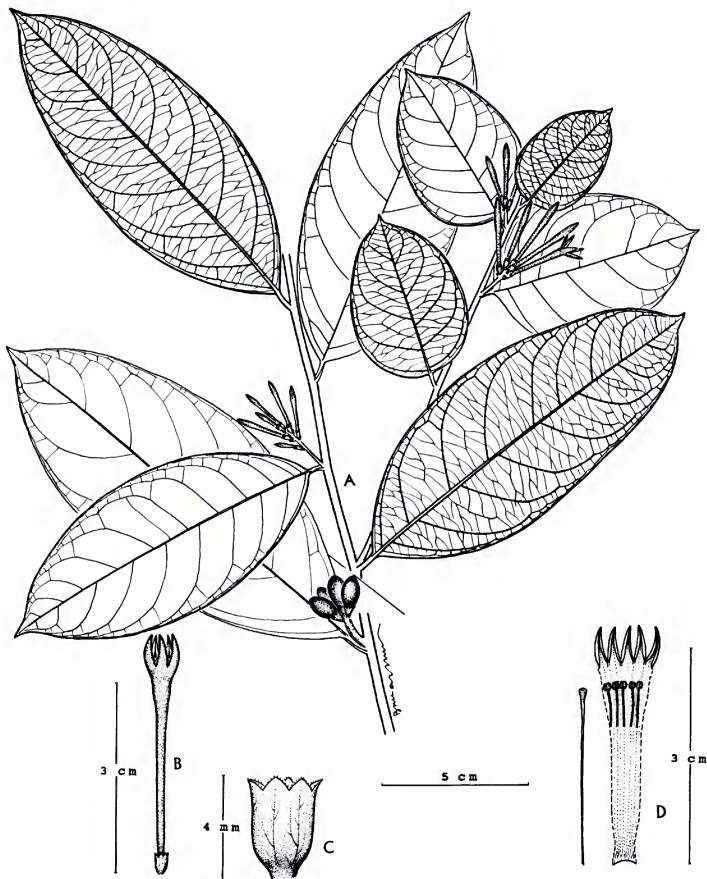


Figure 3. *Cestrum acuminatissimum*.—A. Flowering and fruiting branches.—B. Flower.—C. Calyx.—D. Corolla opened to show stamens and style. A, upper section, B, C after *Davidse & González 21967* (VEN). A, lower section after *Steyermark 101530* (VEN).

toward the base, often narrowly cuneate, not revolute, membranous or firmly papery, both sides pale green, lamina and veins puberulent on both sides, sometimes glabrescent, veins 5–10 on each side, ascending; petiole 5–11 mm long, pilose; minor leaves sometimes present, 14–17 × 5–10 mm, their

petioles 3.5 mm long. *Inflorescences* mass-blooming, terminal and axillary, few (7–10)-flowered, congested fascicles or umbels mostly near the ends of leafy branches, axes 5–10 cm long, slender, tomentose; peduncles 1–2 mm, thickened, unbranched. *Flowers* crepuscular and nocturnal, fragrant, 26–33 mm

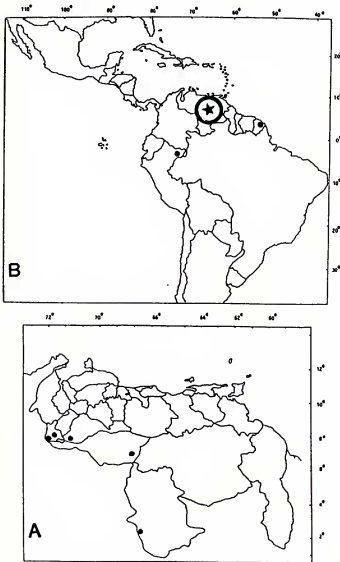


Figure 4. *Cestrum acuminatissimum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

long, pedicels obsolete; bracteoles linear, 1.5–3 mm long, glabrate; calyx cupular, 2.5–3 mm long, basally narrowed and stipe-like, pilose or glabrous outside, the tube 2–4 mm long, teeth 0.5–1 mm long, costate, ciliolate and tufted; corolla white or yellowish green, sometimes with slight purplish coloration on the tube, the tube contracted just above the ovary, then slightly and gradually expanded upward, abruptly expanded just below the apex and around the anthers, slightly contracted at the mouth, 24–32 mm long, glabrous, mouth 3–4 mm wide, lobes narrowly triangular, 4–6 mm long, ciliolate, the folds puberulent; stamens equal, 20–22 mm long, filaments adnate for 18–23 mm, insertion straight, smooth, glabrous, free part 0.5–2 mm, anthers orbicular, 0.5 mm across, included; ovary 1–1.5 mm across, glabrous, disk conspicuous, ovules 6–10, style 18–22 mm long, the apical 2 mm puberulent, stigma capitate, included in the corolla. *Fruit* maturing through violet to purple-black, shiny, ellipsoidal, 10–12 × 5–8 mm, the pulp 1.5 mm thick, spongy, whitish; fruiting calyx hardly ac-

rescent; seeds 4–8, dark brown, 4.5–5.5 mm long. [Francey 6: 211.] Figures 2C, 5.

*Cestrum alternifolium* may be recognized by its umbel-like inflorescences with sessile flowers and the slender corollas that are expanded into a small bulb around the anthers. This species resembles *C. mariquitense*, which tends to be a larger, leafier tree of more mesic regions. The absence of pubescence on the filaments distinguishes it from *C. mariquitense*.

Although Jacquin cited Plumier (Pl. Amer. 7: 150, plate 157, fig. 1, 17. 1758), suggesting that the name *Ixora alternifolia* was based on the plate of Plumier, neither the plate nor one-line description with it provide the details found in Jacquin's own description. Hence we select as lectotype the specimen at W from the garden at Schoenbrunn where Jacquin worked. We think that this specimen was grown from Jacquin's own collections in Martinique, where he said the plant was found, and was probably the material from which the plate was made. *Cestrum confertum* Miller was placed in synonymy by Francey (1935: 211).

Plants of this species are often associated with ants. The flowers often begin to open and emit fragrance from about an hour before sunset to an hour after sunrise. Nectar is scant or absent in this species. Pollination by hawkmoths (Sphingidae) was reported by Haber and Frankie (1989) and White et al. (1994).

*Distribution* (Fig. 6). Aragua, Bolívar, Falcón, Guárico, Lara, Mérida, Miranda, Nueva Esparta, Portuguesa, Sucre, Táchira, Trujillo, Zulia, and the Distrito Federal, as well as on the Island of Testigo Grande. Dry coastal scrub, savannas, riverbanks, deciduous and semideciduous forests below 1300 m and in cloud forests around 2000 m. Also occurring from Mexico to northern South America and in the Antilles.

*Phenology*. The flowering season seems to depend on the climatic patterns of the particular vegetation formations where the species occurs, thus varying from place to place.

*Common names*. *Clavito*, *Dama de Noche*, *Fruito de Culebra*, *Putá de Noche*, *Putica de Noche*, *Tapacamino*, *Tinte*, *Uvito Gallinero*.

*Representative specimens seen*. VENEZUELA. **Aragua**: Colonia Tovar, *Allart* 475 (NY, US, VEN). **Bolívar**: escarpment E of Miamo leading to Hato Nuria, *Altiplanicie de Nuria*, *Steyermark* 88525 (NY, VEN). **Falcón**: Cerro Santa Ana, *van der Werff* & *Wingfield* 3107 (MY). **Guárico**: Estación Biológica de Los Llanos, *Ramírez* 234 (MY, NY), 2148 (MY, NY). **Lara**: Barquisimeto, *Saer* 15 (US, VEN). **Mérida**: Carretera Ejido-Las González, *Ruiz-*



Figure 5. *Cestrum alternifolium*.—A. Branch with flowers and fruit.—B. Flower.—C. Style and stigma.—D. Corolla opened to show stamens. After Benítez 1809 (MY).

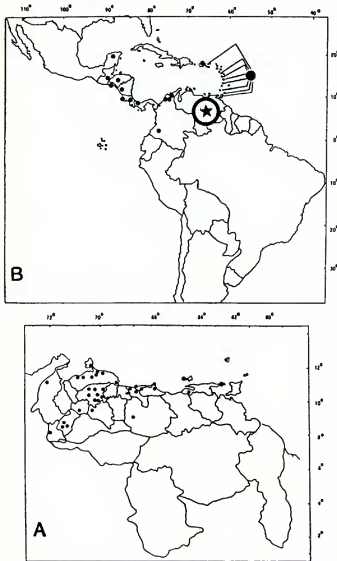


Figure 6. *Cestrum alternifolium*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

*Terán & R. Gallardo 12641* (MERF, MY). **Miranda**: hills between Carenero and Chirimena, *Steyermark & Bunting 102318* (VEN). **Nueva Esparta**: El Espinal—La Guardia, NW de Margarita, *Benítez 1609* (MY). **Portuguesa**: El Rodeo de Santa Lucía, *Benítez et al. 4281* (MY). **Sucre**: Cerro Turimiquire, N slopes above La Trinidad, *Steyermark 62525* (F, VEN). **Táchira**: entre Colón y San Pedro del Río, *Ruiz-Terán 3579* (MER). **Trujillo**: Carretera a Jajó, Distrito Urdaneta, *Benítez 1944* (MY). **Zulia**: Río Guasare, Campamento Carichuano, *Steyermark et al. 123025* (MO, VEN, VZU); Perijá, *Tejera 133* (US). **Distrito Federal**: Jardín Botánico, Caracas, *Nee 17563* (F, VEN, WIS). **Archipiélago Los Testigos**: Testigo Grande, *Fernández et al. 200* (CAR, MY, PORT).

**3. *Cestrum aurantiacum* Lindl., Edward's Bot. Reg. 30: Misc. 71. 1844. TYPE: Cultivated, seed from G. U. Skinner, Chimalapa, Guatemala, not located.**

*Cestrum pedunculare* Dunal, in A. DC., *Prodr.* 13(1): 618. 1852. TYPE: Mexico, *Parón s.n.* (holotype, G, = F photo 34132).

*Cestrum chaculanium* Loes., *Verh. Bot. Vereins Prov. Brandenburg* 65: 97. 1923. *Cestrum aurantiacum* var. *chaculanium* (Loes.) Francey, *Candollea* 6: 104.

1935. TYPE: Guatemala, *Seler 2836* (holotype, B destroyed, = F photo 2972).

*Cestrum paucinervium* Francey, *Candollea* 6: 101. 1935. TYPE: Guatemala, Quiché: San Miguel Uspantán, *Heyde & Lux 3135* (holotype, B destroyed).

*Shrub or tree 1–3 m tall, branched, older trunks gnarled, conspicuously lenticellate, stems terete, flexible, soon glabrate, pubescence of reduced, glandular, perhaps branched, crumpled hairs. Leaves sometimes malodorous, narrowly ovate, 7.5–10 × 4.5–6.8 cm, apically acuminate, basally attenuate, margins undulating, sometimes appearing ciliolate, subcoriaceous to membranous, matte bright green, glabrous, veins 7–9 on each side, strongly ascending, slightly sunken above, main veins elevated beneath, minor veins plane, reticulate, drying conspicuous; petiole canaliculate, 2.3–3 cm long, glabrous; minor leaves wanting. Inflorescences showy, axillary and terminal, mostly emergent from the leaves near the branch ends, lax racemes 1.5–3 cm long, axes 2.5–6 cm long; bracts occasional, foliaceous, 5–10 × 15 mm, pubescent; peduncles mostly short, occasionally to 3 cm long, slightly longer in fruit, tomentose, clusters of 2–6 sessile or subsessile flowers separated by a 2–6-mm-long rachis. Flowers diurnal, unscented, 25–29 mm long, buds with calyx teeth bent out, sessile in groups of 2–3; bracteoles linear, 5–8 mm long, glabrate; calyx tubular, 5.5–7 × 2–3 mm, glabrous outside, the veins conspicuous, pilose inside, tube ca. 5 mm long, teeth narrowly deltoid or subulate, 0.5–1 mm long, the tips subulate, often as long as the tube; corolla bright yellow to orange, 26–28 mm long, glabrous, tube 21–23 mm long, expanding gradually upward, mouth (2–)3–4.5(–5.5) mm wide, lobes 5 mm long, narrowly ovate, apically mucronulate; stamens 17–19 mm long, filaments adnate for 13–15 mm, pubescent to 10–12.5 mm from the base, insertion straight, smooth, tumid, geniculate, slightly denticulate, glabrous or sparingly pilose, free part 4–5 mm; ovary globose 1–1.5 mm across, glabrous, disk inconspicuous, ovules 12–13, style 18–19 mm long, glabrous, stigma capitate, slightly exerted. Fruits numerous per inflorescence, white, ovoid, 8.5–10 × 5–7.5 mm, juicy; fruiting calyx often accrescent, 6–9 mm long, sometimes splitting at the sinuses; seeds 5–9 per fruit, bright dark brown, 3.5–6 mm long. [Francey 6: 102.] Figure 7.*

This species of *Cestrum* is easily recognized in Venezuela by its showy orange or yellow flowers and white fruits. This is the only species of section *Ha-brothamnus* recorded from Venezuela.

The flowers of *Cestrum aurantiacum* are unscent-

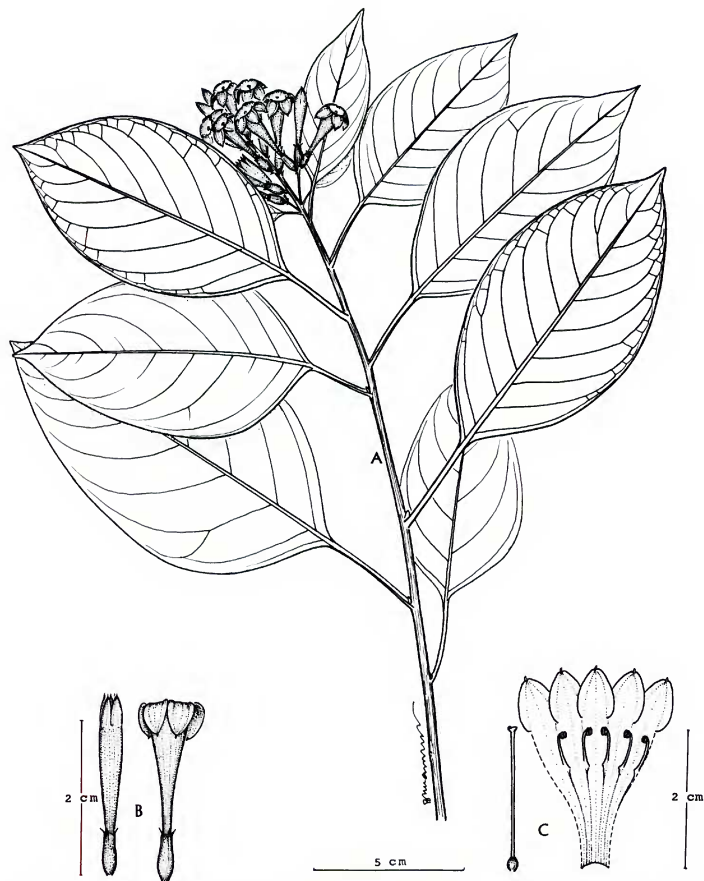


Figure 7. *Cestrum aurantiacum*.—A. Flowering branch.—B. Corollas with lobes open and closed.—C. Corolla opened to show stamens and style. After Ernst s.n. (HBG).

ed and open night and day. The corolla lobes are strongly reflexed or recurved when open.

Chromosome numbers for this species have been reported as  $n = 8$ ,  $2n = 16$  (Dyer, 1963; Sharma & Sharma, 1958; Madhavadian, 1968; Berg & Greilhuber, 1993b).

Stuedel (1840) listed the name *Cestrum aurantiacum* but did not provide a description.

*Distribution.* Occasionally cultivated in tropical gardens for its showy flowers, this species is native to Nicaragua and Guatemala. Although not stated

on the label, the sole Venezuelan collection was undoubtedly from a cultivated plant.

*Specimen seen.* VENEZUELA. *Lara:* Barquisimeto, montium Coro, *Ernst s.n.* (HBG).

**4. *Cestrum bigibbosum*** Pittier, J. Wash. Acad. Sci. 22: 35. 1932. TYPE: Venezuela. Between El Aguacatal and Alto del Cogollal, 1500 m, *Pittier 9245* (holotype, VEN; isotype, US).

*Cestrum laetum* Francey, *Candollea* 6: 378. 1935. TYPE: Venezuela. Aragua: Colonia Tovar, 1854, *Fendler 955* (holotype, NY; isotypes, GH, MO).

*Cestrum pumilum* Francey, *Candollea* 6: 373. 1935. TYPE: Colombia. Santander: Eastern Cordillera, vicinity of Las Vegas, 2600–3000 m, *Killip & Smith 15962* (holotype, NY).

*Cestrum umbrosum* Francey, *Candollea* 6: 375. 1935. TYPE: Venezuela. *Moritz 348* (holotype, W not seen, = F photo 33043).

*Cestrum venezuelense* Francey, *Candollea* 6: 377. 1935. TYPE: Venezuela. Mérida: *Moritz 212b* (neotype, here designated, BM).

Weak, sparingly branched *shrub* or small *tree* 2–6 m tall, sometimes a solitary unbranched wand-like stem, 1–3 cm DBH, branches arching or erect, striate, young branches pubescent, young parts and inflorescences with a faint dark purple color; pubescence of simple, moniliform ascending and crumpled hairs. *Leaves* elliptical or ovate, sometimes narrow, (7–)13–26 × (2–)5–10 cm, apex acute or acuminate, base rounded or attenuate, sometimes unequal or slightly arching downward, margin revolute, membranous to subcoriaceous, dark green and shiny, lighter beneath, glabrous, veins 5–14 on each side, ascending at an angle of 50°–65°, somewhat irregular, major veins slightly impressed above, elevated beneath; petiole canaliculate, 1–3 cm long, glabrous, often curving and twisting depending on orientation of the branch; minor leaves wanting. *Inflorescences* large, pendulous, terminal or axillary panicles, sometimes short axillary racemes; axes dark purple, 10–25 cm long with 1–10 branches, peduncles 8–25 mm long, 0.3–0.7 mm thick, bracts foliaceous, ovate, becoming narrower upward, glabrous, 6–40 × 5–30 mm wide. *Flowers* nocturnal?, 25–30 mm long; pedicels 0.5–1 mm; bracteoles linear, 1.5–3 mm long, glandular pilose; calyx cupular, basally narrowed into an indistinct stipe, 3.5–7 × 2 mm, firmly membranous, often 5-costate, glabrous, tube 2.5–6 mm long, teeth 1 mm long, ciliate, tufted; corolla greenish white, yellowish, or dark olive-green, the lobes pale yellow, 23–29 mm long, narrowly funneliform, the tube gradually expanded upward, mouth 2.5–3 × 1–2 mm, 5 lobes narrowly triangular or oblong, 4–8.5 mm long, apically acute or obtuse; stamens

17–23 mm long, filaments adnate for 13–20 mm, bigibbous, insertion 2 mm long and free, sometimes tumid and sparingly pilose, free part 3–3.6 mm, anthers orbicular, 0.5–0.8 mm across, the surface conspicuously ramiferous; ovary ellipsoidal, 1 × 0.8 mm, with minute papillae near the top, stipitate, the disk yellow, conspicuous, style 15–22 mm long, pilose for 3 mm below the stigma, exerted 1.5 mm, stigma subcapitate. *Fruit* often in dense, pendulous or sometimes arcuate-ascending racemes, dark purple and shiny, subglobose or ovoid; fruiting calyx hardly accrescent, wrinkled, broadly cupular, inside with 2–4 glandular bands that extend to the base of the teeth, the teeth with thickened margins; seeds 4–11 per fruit, yellow, 4.5–6.5 mm long. [Francey 6: 376.] Figures 1B, 8.

This species typically occurs as a slender treelet with reclining branch ends and leaves that diminish in size near the branch apices. However, many examples, perhaps damaged plants, are short shrubs with one or two stiff, inflorescence-bearing branches and larger than normal leaves. In this species, the flowers are inconspicuous and the fruits usually few. The staminal insertion usually bears one or two tooth-like emergences but is sometimes smooth. Some plants greatly resemble *C. salicifolium*, having narrow leaves and dangling inflorescences, but the flowers are sessile on an often caducous subtending bract and not pedicellate as in *C. salicifolium*.

The collection here designated as the neotype of *C. venezuelense*, *Moritz 212b* (BM), was not seen by Francey, and we have not seen another collection of this number among material from G-DC, W, HAL, or HBG, where Francey borrowed material for his revision. However, this specimen agrees with Francey's description and is a close match for specimens of *Moritz 212* (HBG), one of which was annotated by Francey as *C. venezuelense* but was not cited in his protologue. *Moritz 212* (B = F photo 2985) was a different species (*C. scandens* Vahl (as *C. laxiflorum* Dunal)), and is different in HBG (*C. venezuelense*) and G-DC (*C. scandens* Vahl (as *C. laxiflorum* Dunal)). Until an example of *Moritz 212b* that was annotated by Francey is located, we consider the specimen at BM to be acceptable as a neotype. Francey also cited a specimen of Karsten from Colonia Tovar, which we have not located.

*Distribution* (Fig. 9). Aragua, Barinas, Carabobo, Cojedes, Falcón, Lara, Mérida, Miranda, Monagas, Portuguesa, Sucre, Táchira, Trujillo, Yaracuy, and the Distrito Federal. Evergreen cloud forests of low stature (9–11 m) in shade or in natural woodlands; 1200–2200 m. Also in Colombia.



Figure 8. *Cestrum bigibbosum*.—A. Flowering branch.—B. Closed flower.—C. Flower opened to show stamens and style.—D. Stamen. After Badillo 6629 (MY).



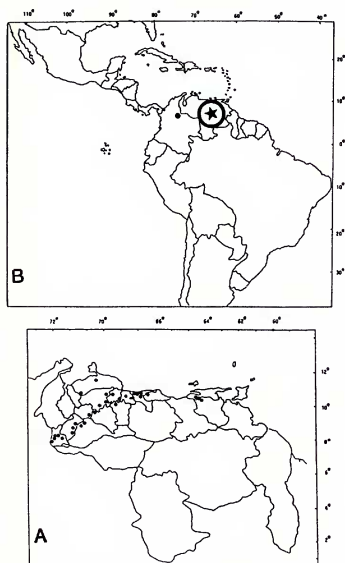


Figure 9. *Cestrum bigibbosum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

**Phenology.** Maximum flowering is in January, diminishing to May. Fruiting is mainly from March to August.

**Common names.** *Mata Perro*, *Uvito*.

**Representative specimens seen.** VENEZUELA. **Aragua:** Carretera Maracay-Choroní, después de las Morochas, Benítez & Rojas 4998 (MY). **Barinas:** road from Altamira to Santo Domingo, van der Werff & Ortiz 5859 (MO, VEN). **Carabobo:** without other locality, Funck & Schlim 627 (G). **Cojedes:** Cerro Azul, fila La Blanquera, Delascio 4118 (CAR). **Falcón:** El Chorro entre La Chapa y Uría, Benítez et al. 5149 (MY). **Lara:** Arriba de Sanare, Badillo 6693 (MY). **Mérida:** Carretera El Celoso—Las Mesas, Benítez & Rojas 4811 (MY). **Miranda:** Los Guayabitos, Baruta, Aristeguieta 2291 (VEN). **Monagas:** slopes of Cerro Negro above La Sabana de Las Piedras, NW of Caripe, Steyermark 61844 (F, VEN). **Portuguesa:** 21 km S de Biscucuy, El Rodeo de Santa Lucía, Benítez et al. 4287 (MY). **Sucre:** foothills of Cerro Turumiquire, SW of Cumanacoa, Knapp & Mallet 6754 (VEN). **Táchira:** Parque Cazadero, 16 km NW of San Cristóbal, Liesner & Guariglia 11658 (VEN). **Trujillo:** between La Playa, SW of Carache and Potreritos de Cendé, Dorr et al. 5099 (VEN). **Yaracuy:** Carretera Nirgua—La Chapa, Benítez et

al. 5097 (MY). **Distrito Federal:** Carretera Caracas—Colonia Tovar, Meier 1211 (MY, VEN).

5. ***Cestrum buxifolium*** Kunth, in Humb., Bonpl. & Kunth, Nov. Gen. Sp. 3: 57. 1818. TYPE: Regni Novo-Granatensis, near sanctuary of Montserrat, 1650 hex, Humboldt & Bonpland s.n. (holotype, P-Bonpl., = IDC microfiche).

*Cestrum parvifolium* Willd., in Roem. & Schult., Syst. Veg. 4: 808. 1819. TYPE: Colombia. Collector unknown (holotype, B-W 4460 not seen, = IDC microfiche).

*Cestrum melanochloranthum* Dunal, in A. DC., Prodr. 13(1): 622. 1852. SYNTYPES: Colombia. Santander: Killip & Smith 15691 (NY), Killip & Smith 18215 (NY), Holton 571 (G? not seen). Venezuela. Mérida: around Portachuelo, Funck & Schlim 1264 (G-DC not seen, = IDC microfiche, = F photo 6911; MO, P).

*Cestrum parvifolium* var. *venezuelense* Francey, Candollea 6: 330. 1935. TYPE: Venezuela. Mérida: Chachopito, near San Rafael, Pittier 13210 (holotype, VEN; isotypes, B destroyed, F, MO, US).

*Cestrum cuneatum* Francey, Candollea 6: 326. 1935. SYNTYPES: Colombia. Linden (Funck & Schlim) 1645 (B not seen, G not seen, = photo F 28356, BR not seen, MO, P); Bogotá, Troll 3587 (G? not seen); Norte de Santander, Killip & Smith 19890 (NY). Venezuela. Mérida: Chachopo, Linden 363 (G not seen). Ecuador. Quetame, André 897 (NY).

Shrub to 3 m tall, often dwarfed and 40–60 cm tall or prostrate, irregularly branched, the branches often ascending, young branches pubescent, young shoots terete, often dark purple, mature branches dark yellowish and tomentose; pubescence of branched trichomes. Leaves ascending, imbricate and facing the stems, elliptical, 2–3(–5) × 0.6–1.1(–1.6) cm, apex obtuse, base attenuate or cuneate, margin slightly revolute, coriaceous to chartaceous, both sides bright green and shiny, glabrous, veins 4–10 on each side, above deeply furrowed, only the principal veins impressed beneath; petiole dark purple, 1.5–3 mm long, sparingly puberulent; minor leaves 4–5 × 1.5–4 mm, sessile. Inflorescences dense, axillary and terminal, axes and pedicels dark purple, axes 3.5 cm long, peduncles 1 cm long, bracts foliaceous, 1.5–5 × 0.5–1.5 mm, pilose. Flowers not closing, fragrance crepuscular and nocturnal, 16–25 mm long; sessile, calyx cupular, 3.5–6.5 × 2 mm, coriaceous, 5-costate, glabrous, the tube 3–5 mm long, the 5 teeth triangular, 0.5–1.5 mm long, ciliate, the sutures pilose; corolla 15–24 mm long, tube dark purple to greenish yellow, ampliate, slightly contracted above the ovary, nearly cylindrical to about halfway up, then expanded and again cylindrical, glabrous, mouth 3–4 (2.5–3) mm across, the lobes triangular, dark purple, 2–5 mm long, the folds yellowish green, pilose, reflexed at anthesis; stamens 11–19

mm long, filaments green, adnate for 4.5–7.5 mm, insertion geniculate-tumid, glabrous or sparingly pubescent, free part 5–9 mm, anthers dark brown, orbicular, 0.5 mm across; ovary lobed, 1–1.5 mm long, disk inconspicuous, ovules 7–13, style purplish, 13.5–19.5 mm long, slightly sunken in the ovary apex, puberulent 1.5 mm below the stigma, stigma capitate, bright green 0.5–1 mm across, exserted 0.5–1 mm from the anthers. *Fruit* in umbellate clusters, dark purple to black, narrowly ovoid, 0.9–1.2 × 0.9–1.1 cm, smooth, the mesocarp dark purple, pulpy, staining fingers and paper deep purple; seeds 2–8 per fruit, light brown, 5–8 mm long. Figures 2B, 10.

*Cestrum buxifolium* often occurs on paramos as a dwarf shrub, flowering and fruiting when less than 60 cm tall with irregular branching and small leaves. In more sheltered places, it may be a shrub to 3 m tall, and such specimens are separated by the characters noted in the key.

*Distribution* (Fig. 11). Andean regions of Lara, Mérida, Táchira, and Trujillo. Rocky exposed slopes, dry pastures, and around watercourses in dwarf cloud forests and paramos; 2650–4000 m. Also in Colombia and Venezuela.

*Phenology*. Flowering is throughout the year, more plentiful from October to May. The fruiting maximum is in April and May.

*Common names and uses*. *Chupa Sol*, *Chungalé*, *Chungagué*, *Chungalé*, *Fruta Negra*, *ñungagué*, *Uvito*. The pulp of the fruit is used as writing ink (Benítez de Rojas et al. 4674, MY; M. López del Pozo 477, 848, 868, MYF).

*Representative specimens seen*. VENEZUELA. **Lara**: Without other locality, *Burandt & Garófalo* V0596 (MY). **Mérida**: Laguna Negra, SE of Laguna de Mucubají, *Barclay & Juajibioy* 9754 (MO); La Culata, Rfo Mucujún, to 15 km NE of Mérida, *D'Arcy et al.* 18236 (MO, MY); Sierra de La Culata, *Ruiz-Terán* 6911 (MERF). **Táchira**: Páramo de Tamá, frontera Colombo-Venezolana, *Steyermark et al.* 98775 (MY, US, VEN). **Trujillo**: Páramos de El Jabón–El Turmal, 15 km al E de Carache, *Ruiz-Terán & López-Figueiras* 949 (MERF).

**6. *Cestrum cuneifolium*** Francey, *Candollea* 7: 60. 1936. TYPE: Colombia. Santander: Eastern Cordillera, eastern slope of Páramo del Hatico, from Toledo to Pamplona, 2900 m, *Killip & Smith* 20590 (lectotype, here designated, NY).

*Shrub* or *tree* 2.5–7 m tall, 3.5 cm DBH, branched in the upper half, branches terete; pubescence of reduced simple, sometimes gland-tipped and perhaps branched hairs. *Leaves* solitary,

narrowly obovate, 6–12 × 2–4 cm, apically short-acuminate or obtuse, basally cuneate and fine-decurrent on the petiole, margins revolute, coriaceous, mostly drying reddish brown, glabrous, veins 7–9 on each side, parallel, arcuate, branching and anastomosing to form a looping, partial submarginal vein, veins elevated beneath; petiole 5–10 mm long, glabrous; minor leaves wanting. *Inflorescences* short, axillary racemes of 5–8 flowers; peduncles 5 mm long. *Flowers* nocturnal?, 18–22 mm long, pedicels to 1.5 mm long, bracteoles foliaceous, 1.5–2.5 mm long, puberulent, caducous; calyx tubular, 4–5 × 2–2.5 mm, the veins inconspicuous, tube 3–5 mm long, glabrous outside, with minute hairs on the upper half within, teeth ca. 1 mm long, minutely ciliolate and tufted; corolla purplish and yellowish, often drying yellowish with darker tips, 16–19 mm long, tube 13–16 mm long, slightly contracted above the ovary, expanding abruptly on emerging from the calyx, expanding gradually upward and appearing sub-cylindrical or clavate, mouth 3–4 (2.5–3) mm wide, lobes narrowly triangular, 2.5–5 mm long, ciliate, the folds tomentose; stamens 10.5–14.5 mm long, filaments adnate for 5.5–8 mm, pilose to 2–2.5 mm from the base, insertion geniculate, tumid, slightly pilose, free part 6–8 mm; ovary 1–2 mm across, glabrous, disk conspicuous, 0.5 mm long, ovules 3–5, style 13–14 mm long, papillose 2.5 mm below the stigma, stigma 0.5 mm long, bilobed, exserted 1 mm. *Fruits* subglobose, 6–8.5 × 6.7 mm wide; fruiting calyx almost unchanged; seeds 1 per fruit, 6–6.5 × 4.5–6.5 mm wide. [Francey 7: 28.] Figure 12.

This species is similar to *Cestrum imbricatum* Rusby, differing conspicuously in its smaller, crowded leaves. The calyx and corolla in *C. imbricatum* are often purple rather than green as in *C. cuneifolium*.

*Distribution* (Fig. 13). Western Venezuela in the Andean states of Mérida and Táchira. In cloud forest; 2200–2900 m. Also in eastern Colombia.

*Phenology*. Collected in flower in March and November.

*Representative specimens seen*. VENEZUELA. **Mérida**: La Carbonera, *Bernardi et al.* 13056 (NY), 17200 (MO, NY); San Eusebio, *Meier et al.* 531 (MY, VEN). **Táchira**: Pico de Vela and Buena Vista *Charpin & Jacquemoud* 13146 (MO, NY); Delicias–Villa Paez, *Morillo & García* 11385 (MERF, MY).

**7. *Cestrum diurnum*** L., Sp. Pl. 191. 1753. TYPE: Cuba. Hortus Cliffortianus (lectotype, here designated, LINN 258.4).

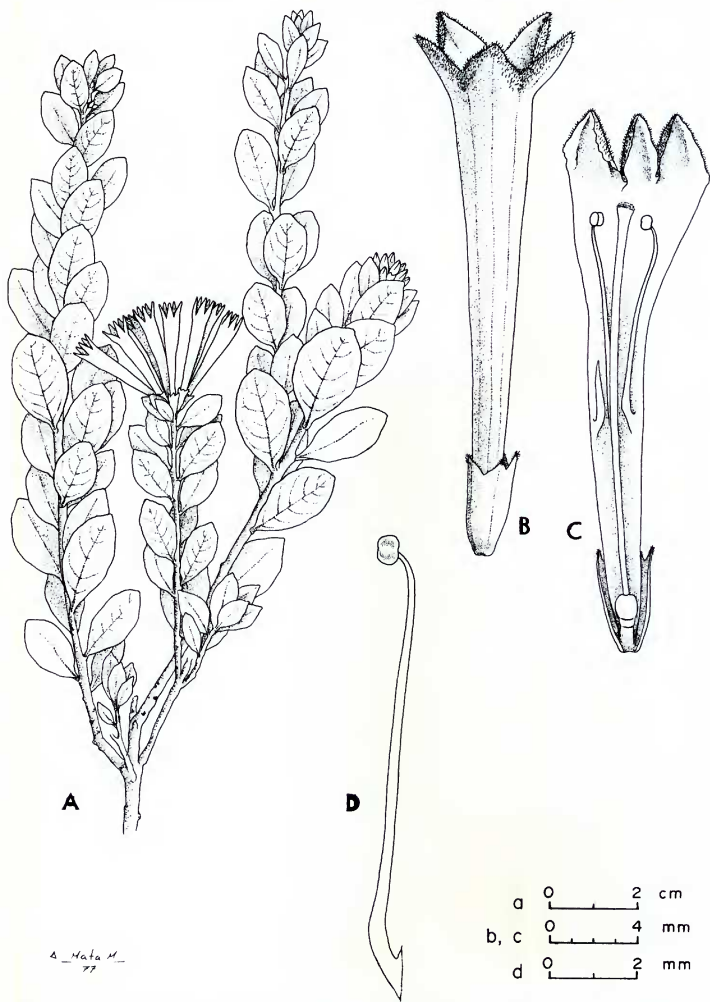


Figure 10. *Cestrum buxifolium*.—A. Flowering branch.—B. Flower.—C. Flower opened to show stamens and pistil.—D. Stamen. After Tamayo 4367 (VEN).

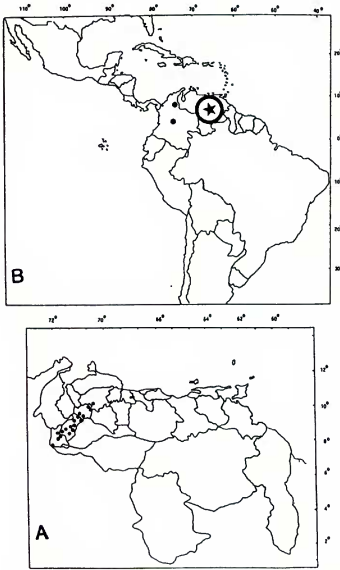


Figure 11. *Cestrum buxifolium*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

- Cestrum fastigiatum* Jacq., Pl. Hort. Schoenbr. 3: 44, pl. 330. 1798. *Cestrum diurnum* var. *fastigiatum* (Jacq.) Stehlé, in Fournet, Fl. Illustr. Guad. Mart. 1281. 1978. TYPE: provenance unknown, plate 330 in Jacquin, 1798 (lectotype, here designated).
- Cestrum odontospermum* Jacq., Pl. Hort. Schoenbr. 3: 44, pl. 331. 1798. *Cestrum diurnum* var. *odontospermum* (Jacq.) O. E. Schulz, in Urb., Symb. Antill. 6: 264. 1909. TYPE: provenance unknown, plate 331 in Jacquin, 1798 (lectotype, here designated).
- Cestrum tinctorium* Jacq., Pl. Hort. Schoenbr. 3: 45 pl. 332. 1798. *Cestrum diurnum* var. *tinctorium* (Jacq.) M. Gómez, Anales Hist. Nat. 23: 269. 1894. TYPE: from Caracas, plate 332 in Jacquin, 1798 (lectotype, here designated).
- Cestrum venenatum* Mill., Gard. Dict. ed. 8. *Cestrum* no. 6. 16 Apr. 1768, non *C. venenatum* Burm. f. (1 Mar.–6 Apr. 1768). *Cestrum diurnum* var. *venenatum* (Mill.) O. E. Schulz, in Urb., Symb. Antill. 6: 263. 1909. TYPE: Jamaica. *Houston* s.n. (BM? not seen).
- Cestrum vespertinum* Lunan, Hort. Jamaicae. 2: 78. 1814, non L. (1771).
- Cestrum laurifolium* Fawc., Jamaica. Bull. 11: 7. 1889, non *Cestrum laurifolium* L'Herit. (1788). TYPE: Jamaica. *Fawcett* 660 (not seen).

Shrub or tree 2–6 m high, crown conical, trunk erect, branches light green, terete; pubescence of erect and crinkly, white, simple hairs, glabrate except on calyces and corolla apices. *Leaves* ovate or elliptical, 4.5–7.5 × 1.5–4.5 cm, apically obtuse or acute, basally narrowly acute to rounded, slightly asymmetrical, gradually attenuate above the middle, firmly membranous or subcoriaceous, bright shiny green above, lighter beneath, glabrous on both sides, veins 6–7 on each side, main veins elevated above, evident and whitish beneath; petiole terete, 5–10 mm long; minor leaves mostly rotund, 10–12 × 4–7 mm, sessile, caducous. *Inflorescences* axillary and terminal, pedunculate congested spicate cymes, racemes, or umbels, peduncles green or tan, elongate, to 9 cm long, bracts foliaceous, 3 × 1.5 mm, pubescent with branched or simple hairs. *Flowers* open and fragrant day and night, 12–17 mm long, often 6-merous, pedicels obsolete; calyx light green, cupular, 2.5–3.5 × 1.5–2 mm, costate, the tube 2–3 mm long, glabrous, teeth less than 0.5 mm long, ciliolate; corolla funnelform, obconical, 11–16 mm long, the tube evenly expanded toward the top, mouth 3–3.5 mm wide, the 5–6 lobes rounded, 1.5 mm long, recurved at anthesis, the folds puberulent; stamens 8–11 mm long, filaments adnate for 7.5–10 mm, pilose 2.5–3 mm from the base, insertion straight, smooth, 0.5–1 mm free, anthers cordiform, 0.5–0.8 mm long; ovary oblong, 1 mm long, seated in a conspicuous disk, style white, 8.5–10 mm long, pilose 2 mm below the stigma, stigma dark green, capitate, slightly exserted. *Fruits* purple-black, subglobose, 11–12 × 8 mm; seeds 13–14, dark brown, 2.5–3.5 mm long. [Francey 6: 284.] Figure 14.

*Cestrum diurnum* is distinctive in its bright white flowers with 5–7 strongly recurved corolla lobes, and in its often slightly bluish foliage.

The plate (332 in Jacquin, 1798) that typifies *Cestrum tinctorium* Jacq. was prepared from a plant cultivated from seeds from Caracas, Venezuela. See D'Arcy (1970) for a discussion of Jacquin's career and typification of his names. *Cestrum vespertinum* Lunan is based on *Jasminum laurinis foliis*..., Sloane Voy. Jamaica 2: 96, pl. 204, f. 2. 1725, and on *Fruticosum, foliis oblongo-ovatis*..., Browne Civ. Hist. Nat. Jamaica 178. 1756. This name was placed in the synonymy of this species by Francey (1935: 284). *Cestrum laurifolium* Fawc. was placed in synonymy by Francey (1935: 284). *Cestrum diurnum* var. *venenatum* (Mill.) O. E. Schulz was placed in synonymy by Francey (1935: 288).

Chromosome numbers of this species have been reported as  $n = 8$  (Gill, 1972), the normal comple-

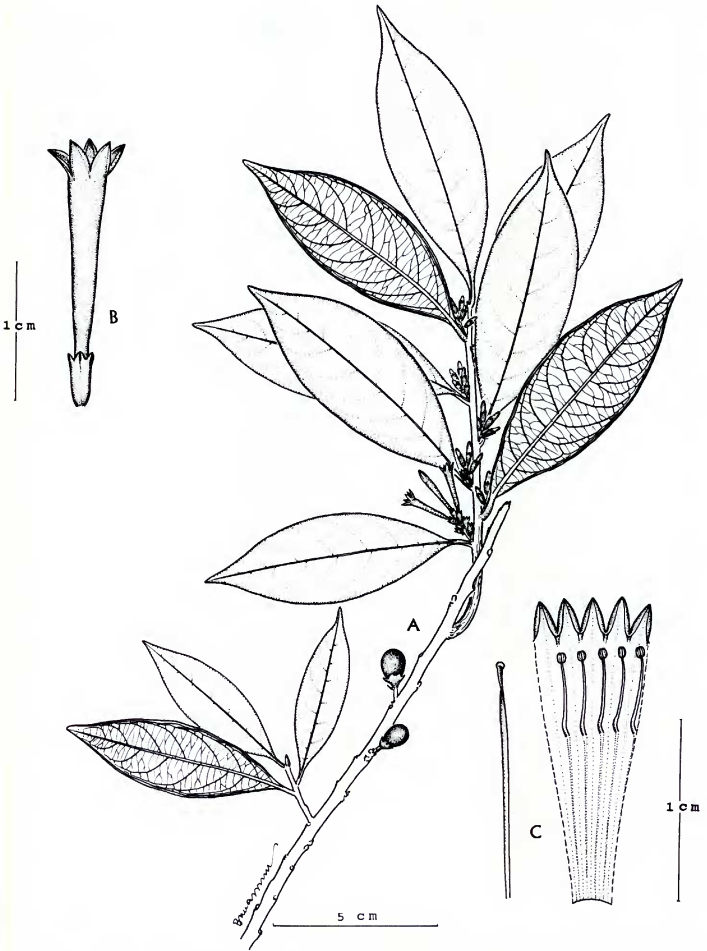


Figure 12. *Cestrum cuneifolium*.—A. Branch with flowers and fruit.—B. Flower.—C. Corolla opened to show stamens and style. After Morillo & Garcia 11385 (MY).

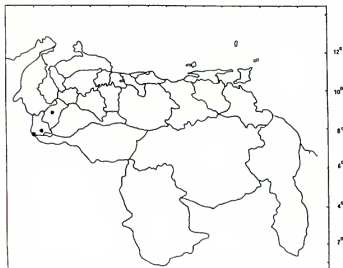


Figure 13. *Cestrum cuneifolium*. Distribution in Venezuela.

ment in the genus. There is also a curious, older report of  $n = 15, 16$  (Sharma & Sharma, 1957, 1958).

**Distribution** (Fig. 15). Cultivated for ornament and sparingly naturalized in Venezuela. Aragua, Carabobo, Falcón, Mérida, Miranda, Sucre, Táchira, and the Distrito Federal. In sun and shade; to 1500 m. Also in Florida and the Antilles and infrequent on Caribbean coasts of Mexico. Perhaps native to the Greater Antilles.

**Phenology.** Flowering in irregular spurts 3–5 times a year. Flowers stay open night and day.

**Common names and toxicity.** *Miel*. Other common names referring to night-blooming probably refer to *Cestrum nocturnum*. The species has been implicated in deaths of horses (Krook et al., 1975).

**Representative specimens seen.** VENEZUELA. **Aragua:** Maracay, Universidad Central de Venezuela, *Benítez 1556* (MY). **Carabobo:** Canoabo, cerca de la Universidad Francisco de Miranda, *Benítez et al. 5162* (MY). **Falcón:** Coro, Plaza Manauare, *Wingfield 5116* (CORO, MY). **Mérida:** Plaza Bolívar de Ejido, *Ruiz-Terán & S. López-Palacios 6113* (MERF, MY). **Miranda:** Petare, *Elías 239* (CAR). **Sucre:** Cultivated, Eulogio Mago, Valley of Cocollar, *Steyermark 62434* (MY, VEN). **Táchira:** Plaza de Lobatera, *Ruiz-Terán 3606* (MER). **Distrito Federal:** Jardines de Caracas, *Lasser 3533* (MY, VEN).

**8. *Cestrum glabrescens*** (C. V. Morton) Steyer. & Maguire, Mem. New York Bot. Gard. 17(1): 463. 1967. *Cestrum tenuiflorum* var. *glabrescens* C. V. Morton, Bull. Torrey Bot. Club 58: 466. 1931. TYPE: Venezuela. Amazonas: Agüita, Mount Duida, *Tate 885* (holotype, US).

**Shrubs** 1.5–4 m tall, adult stems glabrous, young branches puberulent; pubescence of simple and perhaps branched, moniliform ascending and crum-

pled hairs, most parts soon glabrescent. **Leaves** elliptical or ovate, sometimes narrow, (7–)9–16(–21) × 3–6(–8) cm, apex acute, acuminate or abruptly acuminate, base rounded or short-cuneate, margins plane or slightly revolute, firmly membranous, papery or subcoriaceous, dark green above, lighter beneath, glabrous, veins 6–13 on each side, ascending, arcuate or bending toward the tips, impressed above, salient beneath; petiole 0.5–1.8 cm long, glabrous; minor leaves wanting; bracts wanting or caducous. **Inflorescences** axillary spikes or racemes, sometimes forming paniculate masses, 2.5–3 cm long, axes glabrescent. **Flowers** nocturnal?, 23–28 mm long, pedicels 0.5–2.5 mm long, tomentose; bracteoles linear, 3–6 mm long, tomentose; calyx cupular, 3–5 × 1–1.5 mm, costate, pubescent outside, glabrous within, the tube 2.5–4 mm long, the 5–6 teeth unequal, deltoid, 0.5–1 mm long, ciliate; corolla yellowish green with purplish marks on the tube and lobes, 22–27 mm long, the tube gradually expanded upward, mouth 2 mm wide, lobes narrowly ovate, 3–4.5 mm long; stamens 14–19.5 mm long, filaments glabrate, adnate for 13–18 mm, insertion straight, smooth, free part 1–2 mm, the anthers orbicular, 0.3–0.5 mm across; ovary lobed, 1.5–1.8 mm across, glabrous, ovules 10–13, style 15–20 mm long, glabrous, papillose below the stigma, the stigma bilobed. **Fruit** purple, subglobose, 8–11 × 5–8 mm, the pericarp thick; seeds 3–4, olive-colored, 6–8 mm long (*Steyermark 93274*). Figure 16.

This species resembles *Cestrum latifolium*, but the leaves are glabrous and the flowers are longer. When dry, the membranous leaves of *C. glabrescens* are often shiny with yellowish veins. The inflorescences are usually reduced on relatively thick stems, but sometimes they are enlarged into racemose or spicate subterminal clusters.

**Distribution** (Fig. 17). Tepuis (inselbergs) of Amazonas and Bolívar. Associated with low-growing plants along riverine woods and hills in cloud-forest (?); 870–1900 m. Apparently endemic.

**Phenology.** Collected in flower from October to June, and in fruit in May and June.

**Representative specimens seen.** VENEZUELA. **Amazonas:** Dept. Atabapo, slope of cerro Marahuaca, *Liesner 17789* (MO); Cerro Marahuaca, *Steyermark 129677* (MO, MY, VEN). **Bolívar:** above Camp 3, *Maguire et al. 42032* (NY); Caño Mojado, Chimantá–Massif, Torono–tepuí, *Wurdack & Steyermark 1083* (F, NY, TOR).

**9. *Cestrum humboldtii*** Francey, Candollea 6: 393. 1935. TYPE: Perú. Pampayacu, hacienda at mouth of Chincao Río, 1050 m, *Macbride 5129* (holotype, F).

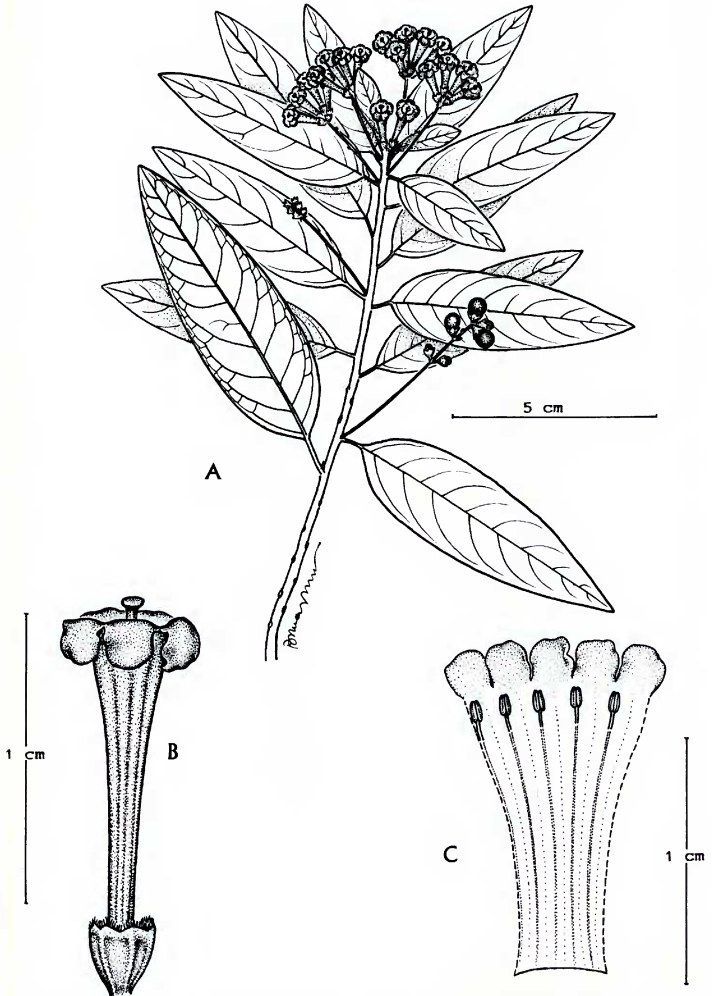


Figure 14. *Cestrum diurnum*.—A. Branch with flowers and fruit.—B. Flower.—C. Corolla opened to show stamens and style. After *Cauz* 12 (MY).

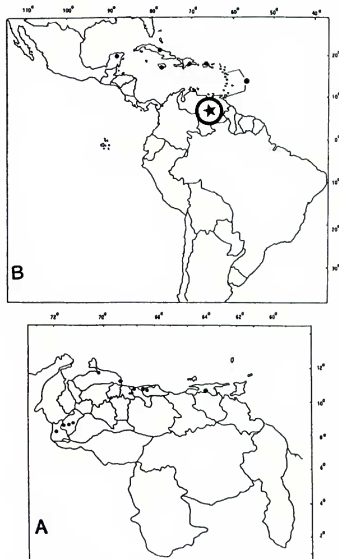


Figure 15. *Cestrum diurnum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

*Cestrum humboldtii* var. *calycinum* Francey, *Candollea* 6: 394. 1935. TYPE: Peru. Muna, trail to Tambo de Vaca, 8000 ft., *Macbride* 4332 (holotype, F).

*Cestrum humboldtii* var. *tenuiflorum* Francey, *Candollea* 6: 394. 1935. TYPE: Colombia. Bogotá, Monte de Fusagasugá, *Triana* s.n. (holotype, G-DC, = IDC microfiche, = F photo 28363).

*Shrub* or *tree* 4–13(–20) m tall, branches terete, densely gray pubescent, the dark color of the stems visible beneath the pubescence; pubescence of branched, stellate and simple hairs. *Leaves* ovate or elliptical, 9–27(–45) × 4.5–11 cm, apically attenuate, base cuneate, occasionally long-cuneate, sometimes somewhat oblique, firmly membranous to coriaceous, sometimes rugose, above drying dark brown, beneath dark green, veins 9–16 on each side, mostly parallel, ascending, and moderately arcuate, the major veins impressed and all veins pubescent, the major veins black, reticulate veined beneath; petiole canalliculate, purple, 1.5–5.5 cm long, puberulent; minor leaves present on young branches, 3 × 1.5 cm, subsessile. *Inflorescences* axillary panicles,

axes basally branched, 2.5–5(–7) cm long, sometimes lax and arching out from the stems, peduncles 2–4 mm long, bracts foliaceous, 18 × 5 mm; bracteoles linear, 6–8 mm long. *Flowers* fragrant, 16–21 mm long; pedicels 0.5–1.5 mm long; calyx mostly tubular, 3.5–6 × 2–2.5 mm, costate, subcoriaceous, sometimes densely tomentose outside, especially near the base, lanose-pubescent within, the tube 2.5–4.5 mm long, the teeth 1–1.5 mm long, ciliate, the tips pilose; corolla whitish, yellowish, or light purple, 14–20 mm long, the tube contracted above the ovary, slightly expanded upward, contracted below the limb and appearing clavate, glabrous outside, mouth 2–2.5 (2.5–3.5) mm wide, the lobes 2–4 mm long, ciliolate, the folds puberulent; stamens 11–14 mm long, filaments adnate for 6–10 mm, the insertion 1–2 mm long, geniculate-tumid, pilose with dispersed hairs, free part 3.5–5 mm, anthers rounded, 0.5 mm across, dark brown; ovary ellipsoid, 0.5–0.7 mm across, glabrous, disk conspicuous, style 10.5–14.5 mm long, puberulent 2 mm below the stigma, stigma capitate, exerted 1 mm. *Fruit* dark purple to almost black, globose or elliptical, 4–6 mm across, slightly stipitate, pericarp slightly thickened, the calyx slightly accrescent and glabrescent; seeds 4–6, dark brown to almost black, 2–5 mm long, embryo white, epicotyl 0.5 × 0.5 mm, hypocotyl 1 × 0.5 mm. [Francey 6: 393.] Figure 18.

This species is recognizable by its large stature, large leaves, and uneven, often floccose whitish pubescence. Except for the pubescence, the leaves mostly dry dark. Most of the collections from Venezuela have glabrate calyces. *Cestrum humboldtii* is apparently related to *C. tomentosum*. While plants of the two species seem amply distinct in Venezuela, some collections from Ecuador suggest a close relationship and are easily confused.

*Distribution* (Fig. 19). Mérida, Táchira, and Trujillo. Cloud forests; 1000–2500 m. Also in the Andes of Colombia, Ecuador, and Peru.

*Phenology*. The species has been collected in flower from January to August and in fruit from August to December.

*Common name*. *Uvito*.

*Representative specimens seen*. VENEZUELA. Mérida: Puente de la Quebrada del Plan hasta Los Magos, Municipio Aricagua, *Bernardi* 6194 (MY, NY, P). Táchira: Parque Tamá, zona de Buena Vista, *Morillo & García* 11475 (MERF, MY). Trujillo: Vía La Morita, *Benítez et al.* 3783 (MY).



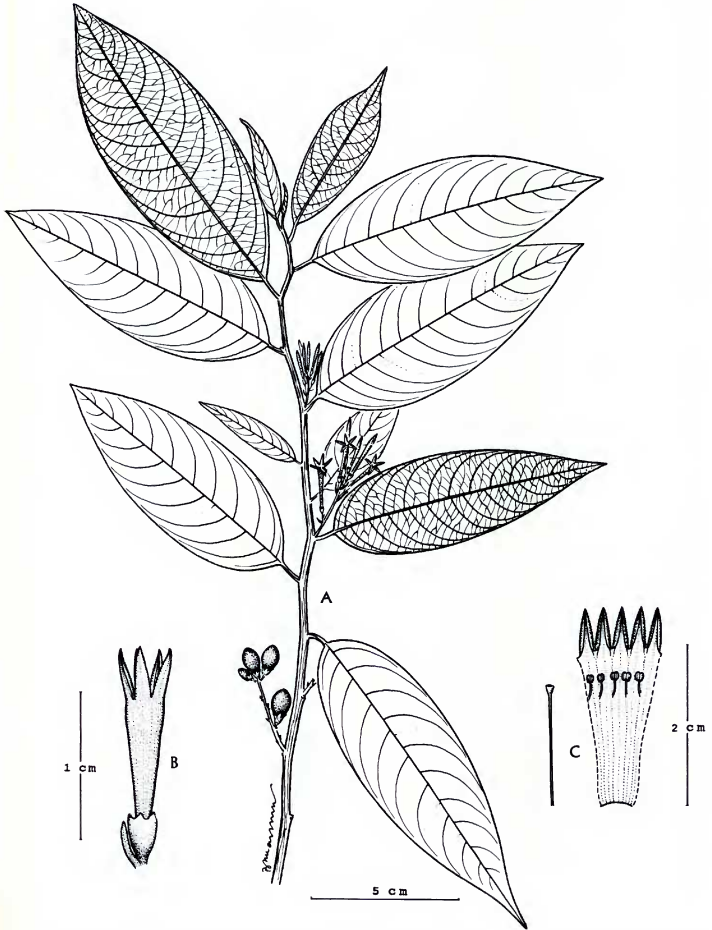


Figure 16. *Cestrum glabrescens*.—A. Branch with flowers and fruit.—B. Flower.—C. Corolla opened to show stamens and style. After Nee 30689 (VEN).

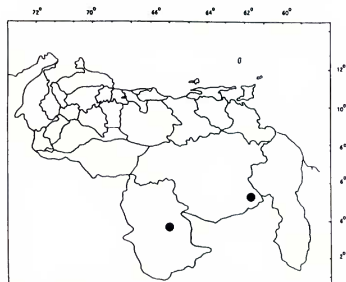


Figure 17. *Cestrum glabrescens*. Distribution in Venezuela.

**10. *Cestrum imbricatum*** Rusby, Descr. S. Amer. Pl. 119. 1920. SYNTYPES: Colombia. Santa Marta: rare on the extreme top of the San Lorenzo ridge, 7000 ft., *H. H. Smith* 1896 (CM, NY).

*Shrub* 2–3 m tall, branches terete, densely leafy, glabrous; pubescence of reduced simple hairs. *Leaves* narrowly ovate, 5–8 × 2–2.5 cm, apically short-acuminate, basally narrowed and decurrent on the pedicel, margin subrevolute, coriaceous and rigid, dark green above, dull green beneath, glabrous, lateral veins 6–8 on each side, main veins elevated beneath, petiole drying dark brown, 5–10 mm long; minor leaves wanting. *Inflorescences* axillary racemes 1–2 cm long, 8–10-flowered, peduncles 4–5 mm long, glabrate. *Flowers* 12–21 mm long, sessile, bracteoles drying almost black, linear, 3.5 mm long, sparingly pilose; calyx tubular, 3–4.5 × 1.5–2.5 mm, glabrous, tube 2.5–4 mm long, teeth deltoid, 0.5 mm long, ciliolate and tufted; corolla purple, 10–19 mm long, tube 13 mm long, slightly compressed at the ovary, expanding gradually, mouth 2.5–3.5 mm wide, lobes 2.5 mm long, folds pilose; stamens 13–14 mm long, filaments glabrous, adnate for 7.5 mm, insertion geniculate, tumid, slightly granular, free part 5.5 mm; ovary lobed, 1 mm across, disk conspicuous, ovules 8, style 11–15 mm long, stigma lobed, 1 mm long. *Fruit* not seen. [Francey 6: 381.] Figure 20.

This species is similar to and may include *Cestrum cuneifolium* Francey, from which it differs mainly in its conspicuously smaller and more uniform leaves. Because specimens from Venezuela lack fully developed flowers, much of the above description was made from the type collection, which is from Colombia.

*Distribution* (Fig. 21). Táchira. 2350–2500 m. Also in Colombia at 2100 m

*Phenology*. Collected in flower in May (Colombia) and November.

*Additional specimens seen*. VENEZUELA. Táchira: Tierra Negra, cabeceras del Río Quinimar, *Steyermark* 101047 (MO, US, VEN).

**11. *Cestrum jaramillanum*** Benítez & D'Arcy, Novon 5: 311. 1995; Phytologia 81: 382. 1996. TYPE: Ecuador. Pichincha: Centenela, Montañas de Ila, 12 km E of Patricia Pilar, virgin rain forest, 550–650 m, 79°19'W, 0°34'S, *Lajtnant & Molau* 15835 (holotype, AAU; isotype, GB).

*Shrub* or small *tree* 2–3 m tall, branched, the branches slender, at first compressed, sometimes drying grooved, later terete, tomentulose, the internodes 3–4.5 cm long; pubescence of reduced, simple, crinkled, ascending hairs. *Leaves* ovate, 10–14 × 4–7.5 cm, apically short-acuminate, basally rounded, truncate, or subcordate, the margin plane, membranous or chartaceous, glabrous above on emerging, the basal half beneath tomentulose on emerging, glabrescent, veins 7–8 on each side, ascending, distally arcuate or looping and forming a submarginal vein 0.5–1 cm from the margin, veins inconspicuous above, the costa and major veins slightly reddish, somewhat elevated and finely puberulent beneath; petiole 5–10 mm long, finely pubescent; minor leaves ovate, 7 × 1.5 mm, sessile, glabrate. *Inflorescences* axillary; peduncle dark, 1–1.5 mm long; bracts foliaceous, 30 × 10 mm wide. *Flowers* nocturnal?, 25–34 mm long, sessile; bracteoles foliaceous, narrowly lanceolate, 10 × 3.5 mm, acuminate, glabrate or pubescent on both sides, persistent; calyx tubular, 4 × 2.5 mm, drying stramineous, basally rugulose, glabrate, tube 3–3.5 mm long, the teeth deltoid to broadly acuminate, 1.5 mm long, faintly 5-costate; corolla pale green, 29–30 mm, the tube 26 mm long, gradually expanded upward, the mouth not contracted, 2.5–3 mm wide, 5-lobed, the lobes 6–6.5 × 1 mm, oblong, the apex acute, the pleated margin short-pilose; stamens 22–23 mm long, the filaments adnate for 21 mm, insertion straight, smooth, glabrous, free part 1 mm, anthers orbicular, 1 mm across; ovary 0.7 mm across, slightly rugose, glabrous, ovules 5–6, style 23 mm long, stigma slightly bilobed, included. *Fruit* ovoid, 8–10 × 6–7 mm, the pericarp thin, about equalling and loosely enclosed in the bract; fruiting peduncle 15 mm long; fruiting bracteole partially enveloping the fruit laterally; seeds 3–4, dark brown, 5–6.5 mm long. Figure 22.

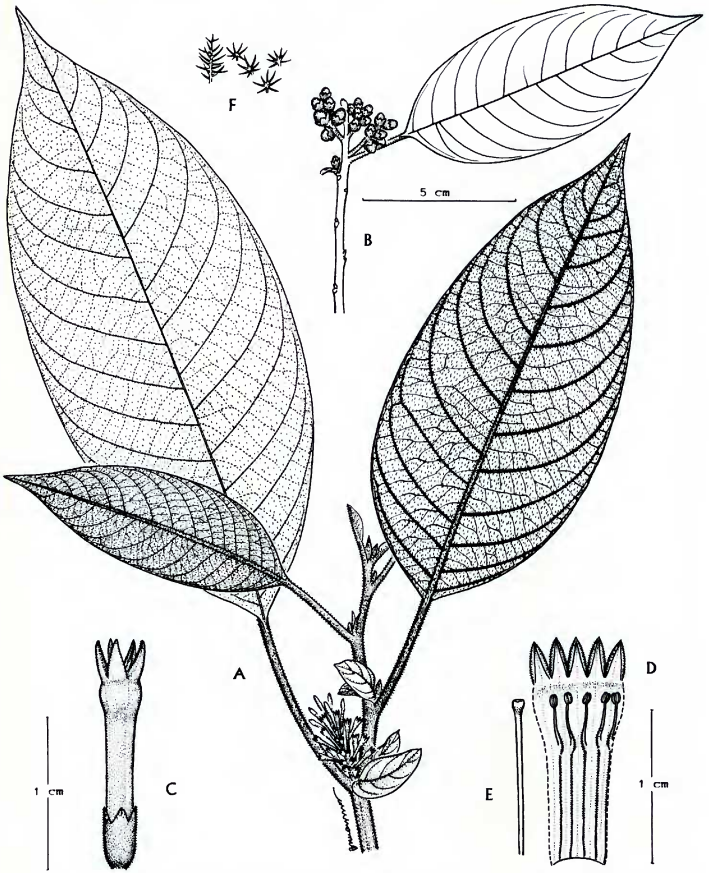


Figure 18. *Cestrum humboldtii*.—A. Flowering branch.—B. Fruiting branch.—C. Flower.—D. Corolla opened to show stamens.—E. Style.—F. Trichomes. After Benítez 4870 (MY).

This species is distinct in its folded bracts, which half envelop the flower and fruit. The inflorescences are congested at the ends of peduncles that appear to elongate in age, leaving one or two fruits at the apex. These mature peduncles are usually shorter than the neighboring leaves. The specimen on which the Ven-

ezuelan report is based is in fruit and is identified with this species with some hesitation.

*Distribution* (Fig. 23). Distrito Federal; 1000–1300 m. Also in Ecuador.

*Phenology*. Flowering and fruiting in November.

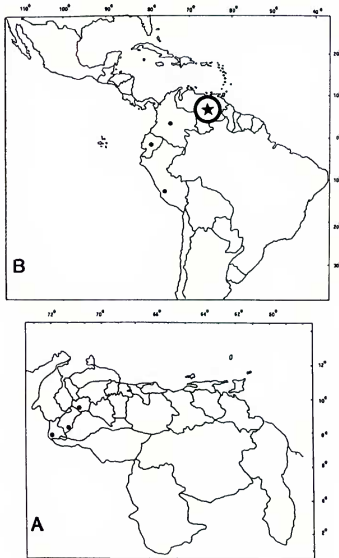


Figure 19. *Cestrum humboldtii*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

*Specimens seen.* VENEZUELA. **Distrito Federal:** Cerro Naiguatá, *Steyermark 92147* (MY, NY, P, US, VEN); Fila Las Delicias, arriba de Naiguatá, 1000 m (fr), *Bunting & Manara 2092* (MY).

**12. *Cestrum latifolium* Lam.,** *Tabl. Encycl.* 2: 5. 1794. TYPE: [Trinidad?] (holotype, P-LA).

*Cestrum tenuiflorum* Kunth, in Humb., *Bonpl. & Kunth, Nov. Gen. Sp.* 3: 61. 1818. *Cestrum latifolium* var. *tenuiflorum* (Kunth) O. E. Schulz, in Urb., *Symb. Antill.* 6: 270. 1909. TYPE: Venezuela. Amazonas: Monte Duida, near district of Esmeraldas of the Orinoco, *Humboldt & Bonpland 1017* (P, = F photo 39047).

*Cestrum floribundum* Willd. ex Roem. & Schult., *Syst. Veg.* 4: 807. 1819. TYPE: Brazil. *Hoffmannsegg s.n.* (holotype, B-W 4443 not seen, = IDC microfiche, = F photo 3019).

*Cestrum ovatum* Willd. ex Roem. & Schult., *Syst. Veg.* 4: 807. 1819. TYPE: Venezuela. Near Esmeraldas, *Humboldt* (holotype, B-W 4439 not seen, = IDC microfiche).

*Cestrum hirtum* Sieber ex Sendtn., in Mart., *Fl. Bras.* 10: 210. 1846, non *C. hirtum* Sw. (1788). TYPE: Martinique. *Sieber 81* (MO).

*Cestrum poeppigii* Sendtn., in Mart., *Fl. Bras.* 10: 210. 1846. TYPE: Brazil. *Poeppig 2979* (lectotype, here designated, HAL, isolectotypes, G not seen, = F photo 6905, G-DC not seen, = IDC microfiche, W not seen, = F photo 33037).

*Cestrum albopunctatum* [*albo-punctatum*] Dunal, in A. DC., *Prodr.* 13(1): 635. 1852. TYPE: Brazil (erroneously attributed to Peru). *Poeppig 2979* (holotype, G-DC not seen, = IDC microfiche; isotypes, HAL, G not seen, = F photo 6905, W not seen, = F photo 33037).

*Cestrum chloranthum* Dunal, in A. DC., *Prodr.* 13(1): 636. 1852. TYPE: Trinidad. *Sieber 143* (holotype, G-DC not seen, = IDC microfiche; isotype, MO).

*Cestrum oliganthum* Dunal, in A. DC., *Prodr.* 13(1): 634. 1852. TYPE: French Guiana. *Leprieur 250* (holotype, G-DC not seen, = IDC microfiche, = F photo 6906).

*Cestrum oliganthum* var. *latifolium* Dunal, in A. DC., *Prodr.* 13(1): 634. 1852. TYPE: French Guiana, collector not indicated [annotated by Francey] (holotype, G-DC not seen, = IDC microfiche, = F photo 23176).

*Cestrum priurei* Dunal, in A. DC., *Prodr.* 13(1): 635. 1852. TYPE: Guyana. *Leprieur s.n.* (holotype, G-DC not seen, = IDC microfiche, = F photo 6904).

*Cestrum billbergianum* Beurl., *Kongl. Vetensk. Acad. Handl.* 40: 140. 1854. TYPE: Panama. Portobelo, *Billberg s.n.* (holotype, S, = MO photo).

*Cestrum respertinum* Griseb., *Fl. Brit. W.I.* 5: 443. 1862.

*Shrub or tree* 1.5–7 m tall, 10–12 cm DBH, bark grayish, smooth, branches terete, elongate, sometimes decumbent or lianoid, sprawling, young parts densely pubescent, glabrescent; pubescence of simple hairs. *Leaves* malodorous, ovate or elliptical, sometimes oblique, 5–11 × 2.5–6.5 cm, apically acuminate, the very tip acute or acuminate, rounded at the base, membranous to firmly membranous, dark green above, light green beneath, both sides pubescent, more so beneath and on the major veins, lateral veins 5–7 on each side, mostly strongly ascending; petiole 0.8–1.5 cm long, pilose; minor leaves wanting. *Inflorescence* mass-blooming, axillary or terminal, of short racemes or short-branched panicles, many-flowered, peduncles 0.7–1.5 cm long, branched, pubescent. *Flowers* crepuscular or nocturnal, fragrant, nectar scant or wanting, 15–20 mm long, pedicels 0.5–0.8 mm long, pubescent, bracteoles arcuate, 1.5–2 mm long, puberulent; calyx membranous, 2–2.5 × 1 mm, 5-costate, sparingly pilose outside, glabrous inside, the tube 1.5–2 mm long, the teeth short, 0.5 mm long; corolla greenish white, 15.5–18 mm long, tube narrow, slightly contracted above the ovary then gradually expanded upward, mouth 1.5 mm wide, the lobes sometimes light purple, narrowly deltoid, 2–4 mm long, ciliate and the folds pilose; stamens equal, 11–14 mm long, filaments adnate for 9.5–12 mm, insertion straight, smooth, adnate, free part 2–2.5 mm, pilose 2–2.5 mm below the insertion and at

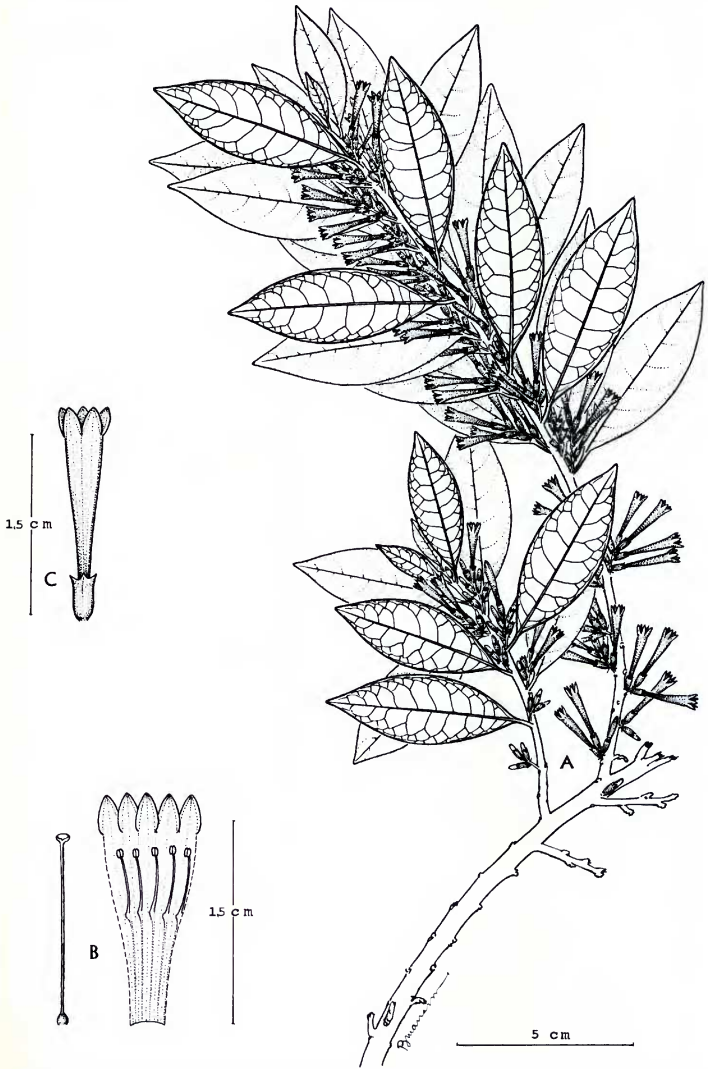


Figure 20. *Cestrum imbricatum*.—A. Flowering branch.—B. Corolla opened to show stamens and style.—C. Flower. After Steyermark & Dunsterville 101047 (MY).

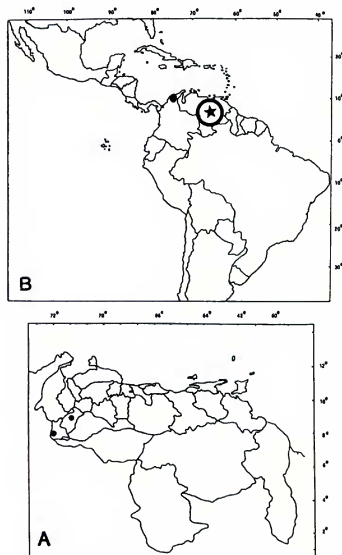


Figure 21. *Cestrum imbricatum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

the base, anthers suborbicular, 0.5 mm across; ovary 0.7–1 × 0.5–1 mm, glabrous, disk inconspicuous, ovules 5–7, style 13–13.5 mm long, about equaling the stamens, stigma subcapitate, included. *Fruit* several per inflorescence, obovoid, 6–10 × 4–8 mm, bluish purple to almost black, shiny, mesocarp white; fruiting calyx slightly accrescent, the limb and lobes spreading; seeds 2–6 per fruit, dark brown, 3–4.5 mm long (Aristeguieta et al. 7260); embryo white. [Francey 6: 289.] Figures 2A, 24.

This species may be recognized by its sparingly pubescent leaf undersides and filament pubescence found well below the point of insertion.

The unpublished name "*Cestrum latifolium* var. *genuinum* Stehlé" was applied by Fournet (1978: 1282) in a sense of including *C. chloranthum*, *C. hirtum*, *C. vespertinum*, *C. nocturnum*, and perhaps *C. latifolium* in a single taxon. This may have been Stehlé's way of indicating a typical variety, or it may be a form taxon which has little meaning, as its name was not validly published in conformity with

the ICBN (which has required clear designation of a type since 1958). Fournet employed this varietal concept for plants from the French Antilles. *Cestrum vespertinum* Griseb. was placed in synonymy by Francey (1935: 289).

**Distribution** (Fig. 25). All states except Lara, Miranda, and Nueva Esparta. Widely distributed in deciduous, semideciduous, riverine, and gallery forests, on savannas and secondary vegetation; 50–1200 m. Also in Nicaragua, Costa Rica, Panama, the Antilles, Colombia, Guyana, Surinam, French Guiana, and Brazil.

**Phenology.** Flowering and fruiting sporadically throughout the year, mainly from January to May, and most heavily in April. The species blooms nocturnally in very fragrant masses for 1–3 days at a time.

**Common names and uses.** *Barriga de Sapo*, *Bello de Noche*, *Bonita de Noche*, *Cazabe*, *Ciruclilla*, *Ciruelo de Monte*, *Clavito*, *Coral Blanco*, *Hoja privada*, *Huele de Noche*, *Ke Tipen* (Panare language), *Mortiño*, *Palo hediondo*, *Quasimillo*, *Rabo Pelado*, *Tepuru*, *Uvito*. Used in popular medicine against mange (Ruiz-Terán 2878, MER, MERF).

**Representative specimens seen.** VENEZUELA. **Amaruro:** between Tucupita and Las Mulas, Steyermark et al. 114590 (MO, NY, VEN). **Amazonas:** Río Siapa, Gutiérrez 225 (TFAV). **Anzoátegui:** between San Durrial and Mata Redonda, Davidse & González 19999 (MO, VEN). **Apure:** P. Nacional Santos Luzardo, Ruiz et al. 4501 (MY). **Aragua:** entre La Victoria y Colonia Tovar, Benítez 563 (MY). **Barinas:** Río Zulia, Santa Bárbara de Barinas, Valverde & Peña 1061 (MER, MY). **Bolívar:** entre Villa Lola y Río Grande, Fernández 2671 (MY). **Carabobo:** Hacienda La Cumaca, Municipio Valencia, Benítez et al. 5159 (MY). **Cojedes:** entre Manrique y Tierra Caliente, Benítez 2169 (MY). **Falcón:** Avaria and cerro Montero, Agostini & Agostini 1171 (MY, VEN). **Guárico:** Estación Biológica de Calabozo, Aristeguieta 5041 (VEN). **Mérida:** La Florida, SE de Santa María de Caparo, Aymard et al. 4496 (MY). **Monagas:** Río Guarapiche, 2 km SSW of Josepín, Pursell et al. 8432 (VEN). **Portuguesa:** Fundo El Chaparral, Río Portuguesa, Aymard & Cuello 5591 (MO, MY, PORT). **Sucre:** P. Nacional Península de Paría, Río Grande Arriba, Benítez et al. 5120 (MY). **Táchira:** Granja Naren, cerca de La Fría, Benítez de Rojas & Rojas 4756 (MY). **Trujillo:** Cerro Gordo, Steyermark & Espinoza 111662 (F, NY, US, VEN). **Yaracuy:** Río Yurubí, Labernabó, Delascio & López 2555 (CAR, VEN). **Zulia:** Casigua, sector Las Cruces, Bunting & Alfonso 7294 (MO, VEN). **Distrito Federal:** Cuenca del Río Macaraó, Montes 61 (VEN).

13. *Cestrum lindenii* Dunal, in A. DC., Prodr. 13(1): 611. 1852. TYPE: Venezuela. Trujillo: 6000 hex, *Linden* (Funck & Schlim) 784 (holotype, G-DC not seen, = IDC microfiche, = F photo 6912; isotype, BM).

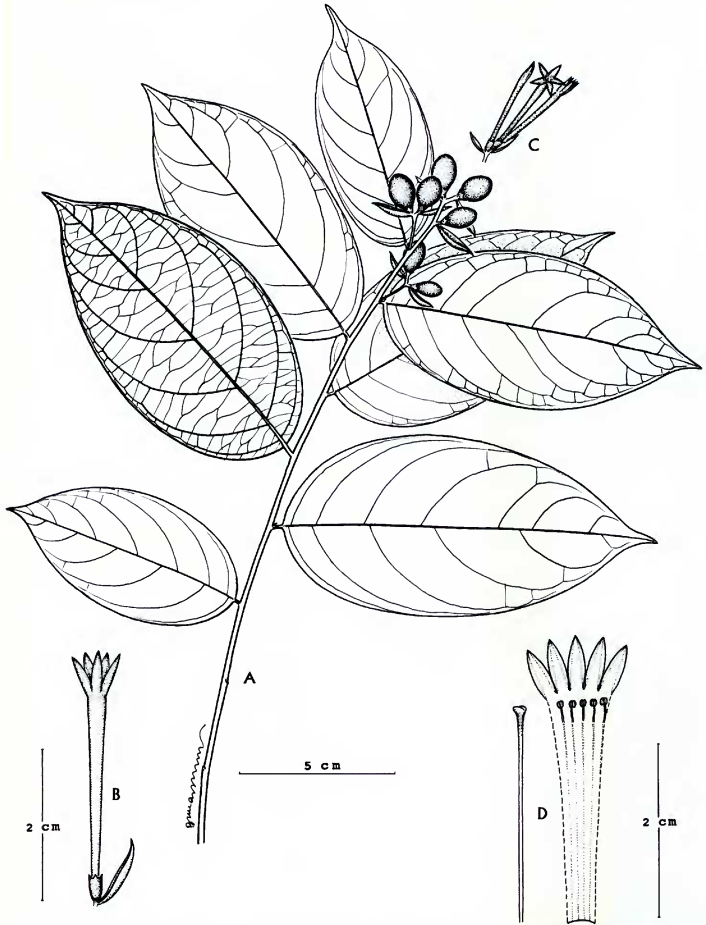


Figure 22. *Cestrum jaramillanum*.—A. Fruiting branch.—B, C. Flowers.—D. Corolla opened to show stamens and style. After Løjtnant & Molau 1585 (AAU).

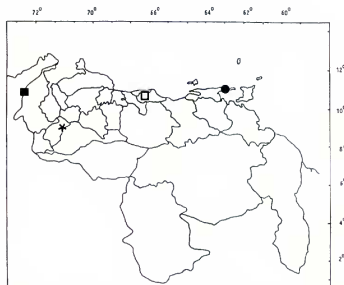


Figure 23. Distribution of *Cestrum* species. Distribution in Venezuela of four species with restricted occurrence. Solid square = *Cestrum tillettii*. Open square = *Cestrum jaramillanum*. Circle = *Cestrum pariense*. Star = *Cestrum ruizerianum*.

*Cestrum amplum* Pittier, J. Wash. Acad. Sci. 22: 35. 1932. TYPE: Venezuela. Mérida: A. Jahn 1075 (holotype, VEN; isotype, US).

*Cestrum dubium* Pittier, J. Wash. Acad. Sci. 22: 30. 1932. non Steud. (1843). *Cestrum costanensis* Steyererm., Acta Bot. Venez. 3: 212. 1968. TYPE: Venezuela. Distrito Federal: Los Venados de Galipán, 1500–1800 m, E. Pütier 166 (holotype, VEN).

*Cestrum amplum* var. *grandifolium* Francey, Candollea 6: 381. 1935. TYPE: Venezuela. Aragua: Colonia Tovar, Fendler 954 (holotype, NY).

Shrub or tree 4–15 m tall, 12–14(–30) cm DBH, the crown little branched, the bark dark and nearly smooth, the branches terete-furrowed, glabrous twigs sometimes stout, often drying blackish; pubescence of simple hairs. Leaves strongly malodorous, narrowly elliptical, 6–13(–16) × 2.7–6 cm, apically acute, obtuse or short-cuspidate, the base cuneate or acute, sometimes slightly decurrent on the petiole, articulated at the base, the margin slightly revolute and slightly folded, plane or undulate, thick-coriaceous or subcoriaceous, dark green and shiny above, light green beneath, glabrous, veins 7–13 on each side, somewhat ascending and parallel, elevated, major veins impressed above, elevated beneath; petiole dark purple, drying black, canaliculate, 4–12(–15) mm long; minor leaves glabrous, 5–14 × 3–3.5 mm, subsessile. Inflorescences lax terminal panicles, axes trigonal, dark purple, 5–8 mm long, glabrous. Flowers closed but fragrant at midday, 18–23 mm long, sessile; calyx dark purple, 4.5–7.5 × 2–3.5 mm, thick, costate, tubular, the tube 3.5–6 mm long, 5-toothed, glabrous outside, the teeth 1–1.5 mm long, pilose within, ciliate and the folds puberulent; corolla dark purple with bright yellow lobes, 17–22 mm

long, tube contracted around the ovary then gradually expanded to the top, glabrous, mouth (2.5–)3–4 mm wide, the lobes inflexed, triangular, 3.5–5 mm long, apex acute; stamens 12–17 mm long, filament adnate for 5–10.5 mm, adnate portion pilose, the insertion geniculate-tumid and denticulate, pilose, free part 5–7.5 mm, anthers orbicular, 0.5–1 mm across; ovary dark purple, obovoid or subglobose, 0.6–2.5 × 0.5–2 mm, glabrous, style green, 9.5–14.5 mm long, apically pilose, stigma bright green, capitate, 0.5 mm long. Fruit purple-black, ovoid or globose, 8–12 × 6–9 mm, the pulp purple; fruiting calyx cupular, dark purple; seeds 5–6 per fruit, dark brown, 6.5–7.5 mm long, drop-like. [Francey 7: 14.] Figure 26.

This upland species has clavate corollas with mouths mostly 3–4 mm wide, wider than most species in Venezuela and suggestive of pollination by birds. The combination of broad corollas and numerous veins on the leaves is diagnostic among the Venezuelan species of *Cestrum*.

"*Cestrum glabrum* Klotzsch & Karsten" is an unpublished manuscript name that identifies a Colombian specimen (Karsten 58) represented by the photo F 2979. The specimen represented is *C. lindeni*.

**Distribution** (Fig. 27). Aragua, Mérida, Miranda, Táchira, and Trujillo. Dense cloud forests and in dwarf forests, 1600–3000 m. Also in Colombia.

**Phenology.** Collected in flower and fruit from March to January, but not collected in February.

**Common names.** Borrachero negro, Cafecito, Laurel, Tábano, Verdecito.

**Representative specimens examined.** VENEZUELA. Aragua: Colonia Tovar, Tamayo et al. 2504 (VEN). Mérida: La Culata, D'Arcy & Benítez 18258 (MO, MY). Miranda: La pica Sabas Nieves-La Silla, Meier 3180 (MY, VEN). Táchira: P. Nacional Los Páramos, Benítez & Rojas 4740 (MY). Trujillo: Arriba de La Puerta, hacia el páramo Los Laureles, Bono 5891 (MY, VEN). Distrito Federal: Junquito, Aristeguieta 792 (VEN).

**14. *Cestrum mariquitense* Kunth, in Humb., Bonpl. & Kunth, Nov. Gen. Sp. 3: 57. 1818. TYPE: Colombia: near Santa Ana and Mariquita, 550 hex., Humboldt (holotype, P-Bonpl., = IDC microfiche).**

*Cestrum bogotense* Willd. ex Roem. & Schult., Syst. Veg. 4: 807. 1819. TYPE: Colombia. Bogotá, Humboldt (holotype, B-W 4454 not seen, = IDC microfiche).

*Cestrum bogotense* var. *latifolium* Francey, Candollea 6: 211. 1935. *Cestrum mariquitense* var. *latifolium* (Francey) Standl. & C. V. Morton, Field Mus. Nat. Hist. Bot., Ser. 18: 1049. 1938. TYPE: Costa Rica.





Figure 24. *Cestrum latifolium*.—A. Flowering branch.—B. Flowers and fruits.—C. Flower.—D. Corolla opened to show stamens and style. After Benítez 92 (MY).

San José: El General, 600 m. Pittier 10509 (holotype, BR not seen; isotype, US).

*Shrub* 2–4 m tall, leafy, much branched, nodes many-branched, stems striate, pilose; pubescence

of simple, moniliform, sometimes collapsing, sometimes gland-tipped, ascending hairs. *Leaves* often crowded, membranous, elliptical or ovate, 3.5–9 × 1.5–4 cm, apically acute or acuminate, basally

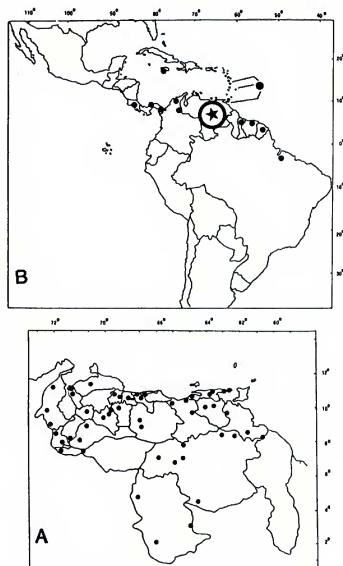


Figure 25. *Cestrum latifolium*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

acute, obtuse or acuminate, light green, glabrous, lateral veins 5–8, ascending, the main veins sparingly pilose beneath; petioles 3–7 mm long, pilose; minor leaves 10–20 × 5–6 mm. *Inflorescences* terminal or axillary, few-flowered, peduncles unbranched, 10 mm long, pilose, hairs sometimes gland-tipped, bracteoles foliaceous, 3–5 mm long, puberulent. *Flowers* crepuscular or nocturnal, fragrant, 29–35 mm long, sessile; calyx cupular, 3.3–5.5 × 1.5–3 mm, inconspicuously costate, tube 3–4 mm long, glabrous outside and in, the teeth 0.3–1.5 mm long, triangular or slightly acuminate, ciliate, apically pubescent; corolla creamy white or yellow green, 28–35 mm long, tube narrow, gradually expanded upward, obconic-cylindrical, mouth 1.5–2.5 mm, the 5 lobes 4–7 mm long, ciliate, the folds puberulent; stamens 25–28 mm long, filaments adnate for 20–26 mm, pilose basally and just below the insertion, insertion pilose-barbate, straight, slightly denticulate, free part 1.5–4 mm, glabrous, anthers orbicular, 1 mm across; ovary globose, 0.5–1 mm across, glabrous, disk inconspic-

uous, style 20–28 mm long, puberulent 1.5–3 mm below the stigma, stigma capitate, 0.5 mm across, exerted 0.5 mm. *Fruit* shiny dark purple, inside purplish white, ovoid, 10–14 mm long, 6–8 mm wide with a small apical protuberance, the pulp 2 mm thick, not juicy; seeds 5–9, dark brown to almost black, 4–6 mm long. Figure 28.

*Cestrum mariquitense* is distinguished by its abundant, congested minor leaves and by the barbate stamen insertions. Additionally, herbarium specimens of this species may be recognized by the blackish leaves with whitish, irregular pubescence.

*Distribution* (Fig. 29). Barinas, Lara, Mérida, Portuguesa, and Táchira. At edges of semideciduous, riverine, and cloud forests; 400–1800 m. Also in Costa Rica and Colombia.

*Phenology*. Flowering is from March to September with a peak in June.

*Common names*. *Jazmin de Monte, Rudo, Cafecillo*.

*Representative specimens seen*. VENEZUELA. **Barinas**: Altamira. *Quintero & Ricardi 1524* (MER). **Lara**: 2 km de Villa Nueva, finca de FUDECO, *Casadiego & Campos 378* (MY). **Mérida**: between Mucuchachí and Canaguá. *Steyermark 56322* (F, MY, VEN). **Portuguesa**: NE of Biscucuy. *Nee & Mori 4107* (US). **Táchira**: entre Río Negro y Puente Salom, *Badillo et al. 7848* (MY).

**15. *Cestrum megalophyllum* Dunal, in A. DC., Prodr. 13(1): 638. 1852. TYPE: Trinidad. *Sieber 176* (lectotype, here designated, G-DC, = IDC microfiche, = F photo 33963; isolectotype, MO).**

*Cestrum clauseni* Dunal, in A. DC., Prodr. 13(1): 637. 1852. TYPE: Brazil. Minas Gerais: *Clausen 446* (lectotype, designated by D'Arcy (1974: 606), MPU; isolectotypes, G, P).

*Cestrum faucheri* Dunal, in A. DC., Prodr. 13(1): 640. 1852. TYPE: Cultivated in Spain, *Faucher s.n.* (holotype, G, not seen).

*Cestrum baenitzii* Lingelsh., Repert. Spec. Nov. Regni Veg. 7: 248. 1909. TYPE: Bolivia. *Bang 1634* (lectotype, designated by D'Arcy (1974: 606), MO).

*Shrub* or *tree* 1.5–8 m tall, 6–8 cm DBH, the trunk erect or somewhat arching, bark smooth and gray-green, young branches and emerging growth puberulent; pubescence of scruffy, simple, sometimes glandular, and sometimes branched hairs. *Leaves* obovate to elliptical, ± upfolded from the median vein, 10.5–27(–34) × 3.6–8(–12) cm, apically acute or attenuate, the base cuneate and somewhat decurrent on the petiole, margin slightly revolute, coriaceous or subcoriaceous, thick, dark green and opaque above, paler and silvery beneath,



Figure 26. *Cestrum lindeni*.—A. Flowering branch.—B. Flower.—C. Corolla opened to show stamens and style.—D. Fruits. After Benítez 4740 (MY).

often drying dark, laminas glabrous on both sides, veins 7–12 on each side, sometimes variably spaced, strongly ascending, the main veins and lateral veins impressed above, elevated beneath and sometimes with a few hairs, minor venation plane beneath and drying light-colored; petiole dark purple, 1.2–2(–3) cm long, canaliculate, slightly flexible, swollen at the base, glabrous; minor leaves

wanting. *Inflorescences* axillary, groups of small fascicles or short pedunculate clusters, axes 3–5 mm long, generally unbranched, puberulent. *Flowers* nocturnal, faintly fragrant, 18–22 mm long, buds white with a purplish tinge, sessile or subsessile; bracteoles linear, slightly arcuate, 1 mm long, puberulent; calyx purple, 2.8–3.6 × 1–1.5 mm, firmly membranous, 5-costate, the tube 2–2.8 mm long,

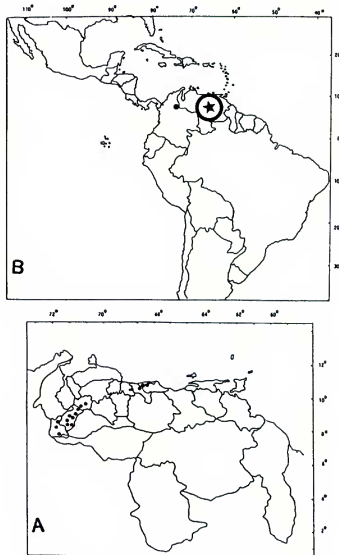


Figure 27. *Cestrum lindenii*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

sparingly pilose outside, irregularly 5-dentate, teeth 0.8 mm long, ciliolate and tufted; corolla greenish white or pale green, 14–20 mm long, tube narrow, expanding gradually upward, slightly contracted around the ovary and again at the mouth, mouth 1–1.5 mm wide, 5-lobate, the lobes white or purplish, narrowly ovate, apically acute, the folds pilose outside, 2.5–3.5 mm long, reflexed or spreading; stamens equal, 11–14 mm long, filaments adnate for 7–11 mm, basally pubescent, insertion mostly straight, sometimes geniculate, tumid, pubescent, free part 2–4 mm, anthers 0.2–0.4 mm across; ovary 0.5–1 × 8 mm, glabrous, ovules 2–3, style 10–14 mm long, sparingly pilose below the stigma, stigma capitate, 0.5 mm across. *Fruit* borne on older woody branches, purple-black, ellipsoidal and ob-ovoid, juicy; seeds 1–3 per fruit, dark brown, 3–4.5 mm long. [Francey 6: 312.] Figure 30.

This species typically has large firm leaves that often dry dark, especially the costa of the leaf undersides and the petioles. Some specimens of *Cestrum lindenii* have similar-appearing dark petioles

and major veins, but the minor venation beneath is not light-colored as in *C. megalophyllum*.

The name *Cestrum schuenckii* Dammer was used by Ule (1908: 401) for a specimen labeled “Peru. Iquitos, July 1902, Ule 6240” deposited at HBG and perhaps other places. *Cestrum faucherii* Dunal was placed in synonymy by Francey (1935: 312).

**Distribution** (Fig. 31). Amazonas, Aragua, Barinas, Bolívar, Carabobo, Cojedes, Falcón, Lara, Mérida, Miranda, Nueva Esparta, Portuguesa, Sucre, Táchira, Trujillo, Yaracuy, Zulia, and the Distrito Federal. Shady, gallery forests; 30–600 m and in primary and secondary cloud forests, especially in very moist and shady sites; 1200–1500 m. Also in Mexico, Central America, the Antilles, Colombia, Ecuador, Peru, Bolivia, and Brazil.

**Phenology.** Flowering is mainly from November to April, with the maximum in January. Fruiting is during the dry season, from January to May, with the maximum in March and April. While sometimes seen full of flowers, plants often produce only a few flowers at a time.

**Common name.** *Bella de Noche*.

**Representative specimens seen.** VENEZUELA. **Amazonas:** Río Negro, Caño Baría, *Liesner* 16999 (MO, MY, VEN). **Aragua:** Carretera hacia Ocumare de La Costa, *Benítez & Aguilera* 4692 (MY). **Barinas:** Río Caparo, *Liesner & González* 9478 (MO, NY, VEN). **Bolívar:** between Río Mawarimuna at base of Neblina and Río Baría, *Thomas et al.* 3392 (NY, MY). **Carabobo:** Río San Gián, arriba de la Toma, S Borburata, *Steyermark & Steyermark* 95366 (NY, US, VEN). **Cojedes:** Cerro Azul, fila La Blanquera, NE de la Sierra, *Delascio* 7579 (VEN). **Falcón:** Sierra de San Luis, arriba de Santa María, *van der Werff et al.* 3209 (WIS). **Lara:** Laguna Negra, loma de Los Narajos, S de Río Claro, *Steyermark et al.* 111522 (US, VEN). **Mérida:** La Isla, Jají, *López-Palacios* 1886 (MO, US, VEN). **Miranda:** El Guapo, *Aristeguieta* 4009 (MO, VEN). **Nueva Esparta:** Cerro Copey, *Hoyos & Delascio* 4285 (CAR, VEN). **Portuguesa:** Quebrada Cuchilla Alta, *Stergios et al.* 6626 (MO, MY, NY, PORT). **Sucre:** Río Grande Arriba hasta La Pava, *Benítez et al.* 5124 (MY). **Táchira:** Quebrada La Buenañita, Las Coloradas, *Benítez & Rojas* 5046 (MY). **Trujillo:** 1 km W of Guaramecal, *Liesner et al.* 12836 (MO, VEN). **Yaracuy:** Cerro Negro, Río Cocorotico, *Steyermark & Wessels Boer* 100397 (MO, US, VEN). **Zulia:** Río Guasare, Serranía de Perijá, *Gentry* 41165 (MO, NY). **Distrito Federal:** between Colonia Tovar and Carayaca, 2.3 km below the junction with Colonia Tovar–Caracas road, *Croat* 54467 (MO, NY, VEN).

**16. *Cestrum microcalyx*** Francey, *Candollea* 6: 301. 1935. TYPE: Colombia. Prov. Túquenes, 3000 m, *Triana* 2295 (holotype, G-DC, = IDC microfiche; isotype, P).

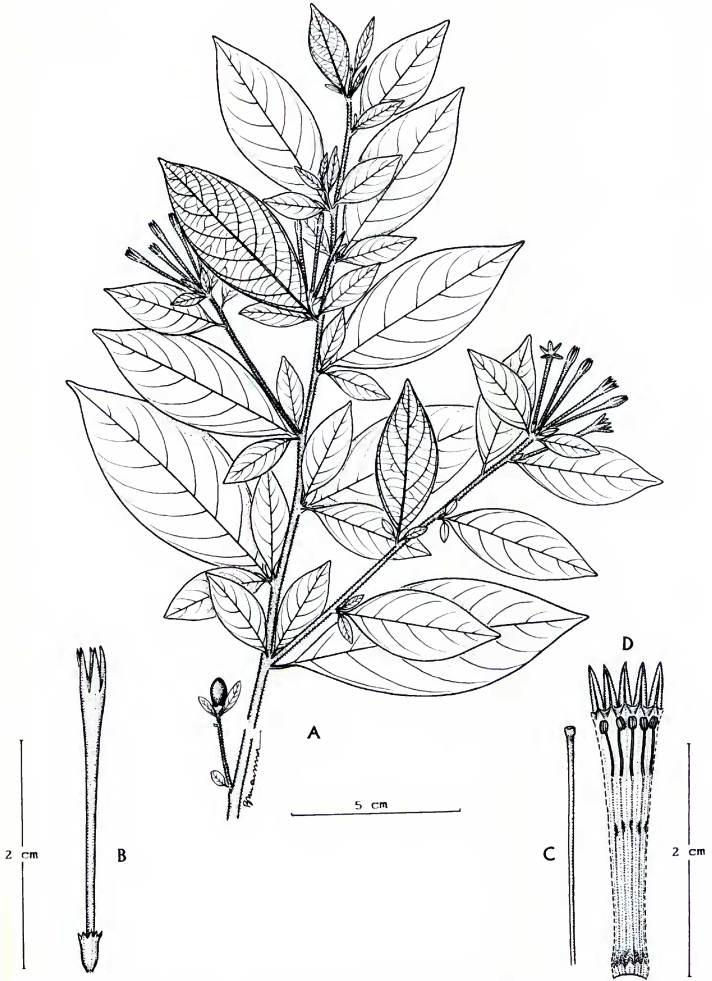


Figure 28. *Cestrum mariquitense*.—A, Branch with flowers and fruit.—B, Flower.—C, Style.—D, Corolla opened to show stamens. After Benítez 4901 (MY).

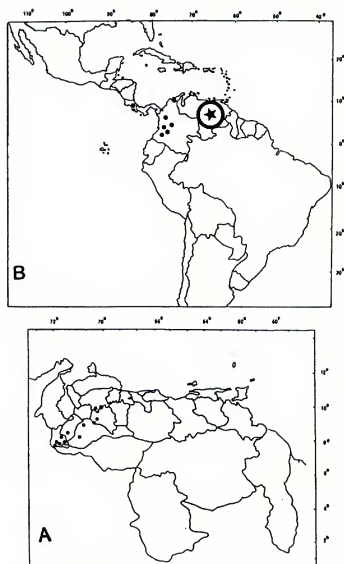


Figure 29. *Cestrum mariquitense*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

*Cestrum sylvaticum* Francey, *Candollea* 6: 316. 1935, non *C. sylvaticum* Dunal (1852). TYPE: Peru. Junín: Pichis trail, Yapas, 1300–1600 m, Killip & Smith 25483 (lectotype, here designated, F; isolectotypes, NY, US).

*Cestrum standleyi* Francey, *Candollea* 6: 249. 1935. TYPE: Costa Rica. San José: Zurquí, 2000–2500 m, Standley & Valerio 48082 (holotype, F).

*Cestrum tenuissimum* Francey, *Candollea* 6: 248. 1935. SYNTYPES: Bolivia. Mapiñi, 700 m, Troll 2752 (B destroyed, G not seen, F); Buchtien 32 (B, G, LAU, none seen, B = F photo 28375, MO).

*Shrub or tree to 6 m tall, much branched from 1.5 m above the base, 5–15 cm DBH, branches bright grayish green, young branches puberulent; pubescence scant, of reduced, simple, mostly gland-tipped hairs. Leaves narrowly elliptical, 8–17 × 2–5.5 cm, apically acuminate, the tips sometimes arching, basally obtuse, or acute, sometimes slightly oblique, margin mostly plane, firmly membranous, dark green and lustrous above, lighter beneath, glabrous, veins 6–11 on each side, often ill-spaced, ascending, major veins not impressed,*

*elevated beneath, minor venation inconspicuous on both sides; petioles 7–12 mm long; minor leaves generally wanting. Inflorescences axillary, short, lax, few(–7)-flowered racemes, axes 2–12 mm long. Flowers nocturnal, 18–23 mm long; sessile, inserted along the rachis leaving a cicatrice when fallen; bracteoles to 1 mm long, filiform, caducous; calyx tubular-urceolate, 2–3 mm long, inconspicuously costate, tube 1.5–2.5 mm long, glabrous, the teeth 0.5 mm long, unequal, narrowly triangular, curving outward, mostly glabrate, ciliate; corolla light yellowish green, 19–22 mm long, cylindrical, the tube slender, slightly contracted at the ovary, then hardly expanded upward, expanded apically around the anthers and contracted at the mouth, the mouth 1.5–2 mm across, the lobes narrowly triangular, 3–4.5 mm long, ciliate and puberulent on the folds, otherwise glabrous; stamens 15.5–17.5 mm long, filaments adnate for 12–15 mm, pilose 1–2 mm below the insertion, insertion straight, smooth, free part 2–3.5 mm, anthers orbicular, 0.5 mm across; ovary globose, 0.5–0.8 mm across, disk inconspicuous, ovules 7–8, style 16–17 mm long, laxly puberulent near the apex, exceeding the stamens by 0.5 mm. Fruit dark purple, globose, 4–10 mm across, with little pulp or juice; seeds black, 2–3, 9 mm long. Figure 32.*

This species may be confused with *Cestrum racemosum* or *C. megalophyllum*, but it has fewer, more membranous leaves with fewer veins than the former and smaller leaves than the latter.

*Distribution* (Fig. 33). Aragua, Táchira, and the Distrito Federal. Restricted to cloud forests; 800–1700 m. Also in Nicaragua, Costa Rica, Panama, Colombia, Ecuador, Peru, and Bolivia.

*Phenology*. Collected in flower in May and June, especially the latter, and in fruit in October.

*Common names*. *Tapa Camino*.

*Representative specimens seen*. VENEZUELA. Aragua: Río Hondo, carretera Maracay–Choroní, Benítez & Rojas 3994 (MY). Táchira: Cerro de Cuite, quebrada La Colorada, Steyermark et al. 119733 (MO, NY). Distrito Federal: Carretera Colonia Tovar–Puerto Cruz, Trujillo 15831 (MY).

17. *Cestrum neblinense* D'Arcy & Benítez, *Ann. Missouri Bot. Gard.* 77: 206. 1990. TYPE: Venezuela. Amazonas: Dept. Río Negro, cerro de La Neblina, 0°51'N, 65°57'W, 700 m, Liesner 16661 (holotype, MO; isotypes, MY, VEN).

*Shrub* 1–2 m tall, branches reddish, tomentose, hairs curved, ascending, glabrescent, the base of the internodes and inflorescences thickened; pubes-

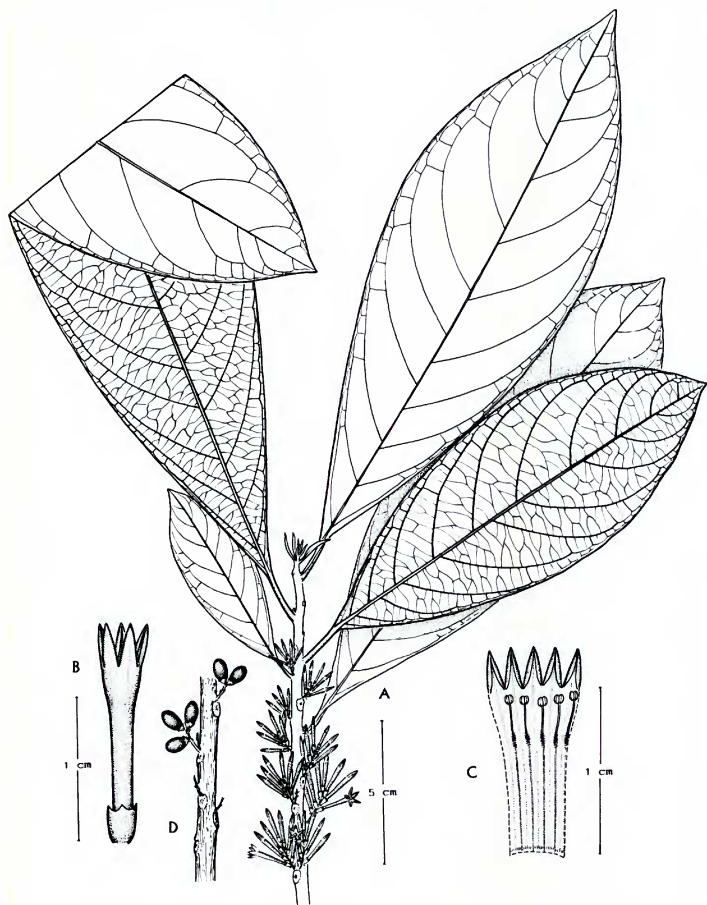


Figure 30. *Cestrum megalophyllum*.—A. Flowering branch.—B. Flower.—C. Corolla opened to show stamens.—D. Twig with fruits. After Benítez 3617 (MY).

cence of small, simple, coarse, multicellular yellowish hairs, often reduced. *Leaves* linear or narrowly ovate, sometimes slightly oblique, 5–10 × 0.5–2.5 cm, attenuate above the middle, apically obtuse, basal third attenuate, margin slightly revolute, subcor-

iaceous or papery, bright green above, lighter beneath, veins 4–6 on each side, strongly ascending, the major veins sunken, venation elevated beneath; petioles 2–4 mm long, slender; minor leaves wanting. *Inflorescences* of 1–3 flowers grouped in the leaf

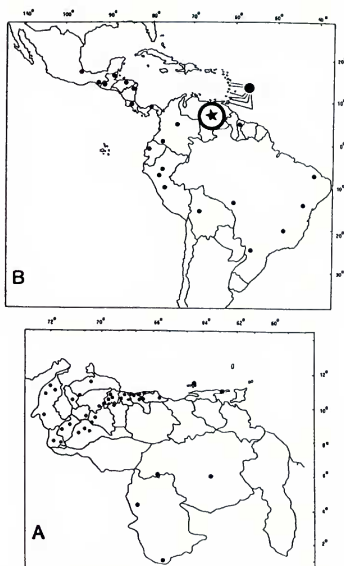


Figure 31. *Cestrum megalophyllum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

axils or terminal, peduncles tomentose, 2–5 mm long, bracts 4–5 mm long; bracteoles 2 mm long. *Flowers* 27–30 mm long, sessile or on pedicels 1.5 mm long, bracteoles linear, ca 3 mm long, pubescent; calyx cupular, 2.5–3.5 × 2.5 mm, 5-costate, glabrate, tube 2.2–3 mm long, 5-toothed, the teeth undulate, ciliolate, 0.3–0.5 mm long; corolla white, 25–27 mm long, tube narrow, slightly expanded upward and at the throat, mouth 3.5 mm wide, the lobes narrowly elliptic, ciliolate, 2.5–3.5 mm long; stamens subequal, 17–19 mm long, filaments adnate for 16–17.5 mm, pilose at the base, insertion straight, smooth, free part 1.5–2 mm, anthers suborbicular, 0.8 mm across; ovary globose, 1 mm across, style 19 mm long, moderately pilose for 10 mm below the stigma, stigma capitate. *Fruit* ellipsoidal or obovoid, 9 mm long, 6.5–7 mm wide; fruiting calyx ca. 6 mm long; seeds 7, 5–7 mm long. Figure 34.

This species is distinctive in its coriaceous, narrow leaves and abbreviated inflorescences. The colors of the fruit and seeds are unknown.

*Distribution* (Fig. 35). Amazonas. Evergreen cloud forests in the Cerro La Neblina, partly flooded forests along the River Yátúa in sandy soil; 780–2200 m. Apparently endemic.

*Phenology*. Collected in flower and fruit in March.

*Additional specimens seen*. VENEZUELA. Amazonas: rocky beaches, Cañon Grande, SSW Cumbre Camp, Río Yátúa, cerro La Neblina, Maguire *et al.* 42500 (MO, NY, US).

**18. *Cestrum nocturnum* L., Sp. Pl. 1: 191. 1753. TYPE: Jamaica. Pl. Hortus Cliffortianus (LINN 258.1), fide Howard, Fl. Lesser Antilles 6: 276. 1989.**

*Cestrum suberosum* Jacq., Pl. Hort. Schoenbr. 4: 26, pl. 452. 1798. TYPE: from Caracas, pl. 452 in Jacquin, 1798 (lectotype, here designated).

*Shrub* 2–3 m tall, branches angular, sprawling, leafy, olive or bluish green, lenticellate, emerging growth puberulent; pubescence of simple hairs. *Leaves* narrowly ovate to ovate, 8–13 × 2–4.5 cm, evenly attenuate from the middle, the tip acute, basally obtuse or narrowly cuneate, membranous to coriaceous, dark shiny green above, lighter beneath, veins 7–8 on each side, ascending, elevated beneath; petioles 1–2 cm long, slender, glabrous; minor leaves wanting. *Inflorescences* axillary and terminal, many-flowered racemes or panicles, axes glabrous, 3–8 cm long; peduncle 5–10 mm long, glabrous. *Flowers* nocturnal, heavily fragrant, yellowish or greenish white, 21–27 mm long, buds sometimes with a slight violet tint, pedicels 0.5 mm long; bracteoles 2, one foliaceous, 3.5 mm long and puberulent, the other linear, pilose 2.5 mm long; calyx cupular, 2.5–3.5 × 1–1.5 mm, glabrous outside, costate, tube 2–4.5 mm long, 5–6-toothed, teeth 0.5–1 mm long, ciliolate and minutely tufted; corolla 20–30 mm long, the tube gradually expanded upward, slightly contracted beneath the ovary, 5-lobed, mouth 2.5 mm wide, lobes 2–5 mm long, puberulent, apically obtuse or slightly apiculate; stamens inserted equally, 13–15.5 mm long, filaments adnate 10–12 mm, mostly pilose from the base to the middle of the adnate portion, the insertion straight or geniculate, bidentate, glabrous, free part 2.5–3 mm; anthers included; ovary 0.5–1 mm long, the disk yellow, about as long as the ovary, clearly delimited, ovules 7–9, style exerted 1 mm, puberulent 2 mm below the stigma, stigma bilobed. *Fruit* white, sublustrous, globose, 5–9 mm across, mesocarp white, spongy-granular, the placenta green, juicy; fruiting calyx slightly accrescent; seeds 1–3 per fruit, black, ovoid, 2.5–6 mm





Figure 32. *Cestrum microcalyx*.—A. Branch with flowers and fruit.—B. Flower.—C. Corolla opened to show stamens and style. After Benítez 3093 (MY).

long, abortive ovules dull yellow-orange. Figure 36; Nee, 1986: 55.

*Cestrum nocturnum* is cultivated as an ornamental for the nocturnal fragrance of its flowers. The greenish flowers have small, glabrous calyces, and the axes are slender, although the inflorescence structure varies greatly. Herbarium specimens are

superficially much like other species, but the two small teeth at the stamen insertion are a good recognition character.

Chromosome numbers of this species have been reported as  $n = 8$ ,  $2n = 16$ , the normal complement for the genus (Darlington & Wylie, 1955).

*Distribution* (Fig. 37). Aragua, Mérida, Miran-

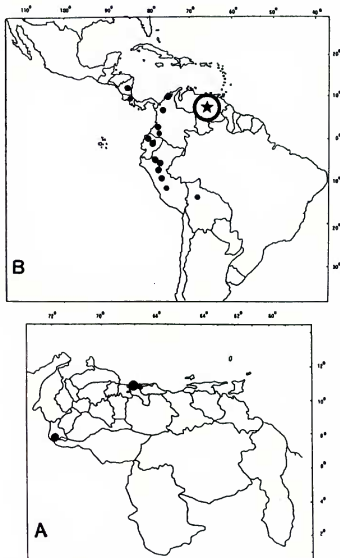


Figure 33. *Cestrum microcalyx*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

da, Monagas, Sucre, Táchira, and the Distrito Federal. Widely spontaneous and naturalized; sea level to 1300 m. Also in Mexico, the Antilles, and Central America. Perhaps native to Central America.

**Phenology.** Flowering occurs in short or long spurts or almost continuously throughout the year but is heaviest in June. Flowering periodicity was also reported by Sachs (1985). Fruiting is sporadic, especially in the second half of the year.

**Common names.** *Bella de Noche*, *Dama de Noche*.

**Representative specimens seen.** VENEZUELA. **Aragua:** Maracay, *Benítez 1033* (MY). **Mérida:** Municipio San Juan, *Quintero 29* (MER). **Miranda:** cultivated, Carriçal, Distrito Guacaipuro, *Tillett 746-454* (MY). **Monagas:** San Antonio de Maturín, *Barrios 14* (MY). **Sucre:** Chamariapo, 6 km de Cariaco, *Ruíz-Terán & López-Palcacios 9975* (MY). **Táchira:** Distrito Cárdenas, Río Torbes, *Bono 5043* (MY). **Distrito Federal:** Caracas, *Lasser 3469* (VEN).

**19. *Cestrum olivaceum*** Francey, *Candollea* 6: 129. 1935. TYPE: Colombia. Santander: eastern cordillera, vicinity of Charta, 2000–2600 m, *Killip & Smith 18917* (lectotype, here designated, NY).

*Shrub* 3–4 m tall, branches climbing, terete, tomentose; pubescence of stellate hairs. *Leaves* descending or disposed vertically, ovate, 5–11 × 3.5–6.5 cm, attenuate from the lower third upward, apically acute, basally rounded, margins mostly drying slightly revolute, densely rugose above and beneath, subcoriaceous, dark olive green above, lighter beneath, pubescent, more so beneath, veins 6–8 on each side, elevated beneath; petiole 0.5–1 cm long, tomentose; minor leaves wanting. *Inflorescences* short, axillary, condensed racemes, axes 1.5–2.5 cm long; bracts filiform, 5.5 mm long, pubescent. *Flowers* nocturnal?, 25–26.5 mm long, sessile; calyx green, 5–7 × 3.5–4 mm long, tubular, stellate pubescent outside, glabrous inside, tube 5.5 mm long, 4–5-dentate, teeth 1.5 mm long, obtuse or acute; corolla lilac, apically with whitish and purplish markings, funnellform, 24–26 mm long, pubescent outside, especially above the middle, tube contracted below and above the ovary, mouth 4 mm wide, lobes 4–6.5 mm long, deltoid; stamens 17–19.5 mm long, filaments glabrous, adnate for 10–12 mm, insertion geniculate-tumid, free part 7–8.5 mm, anthers 0.7 mm long, orbicular; ovary subglobose, 1.5 mm across, glabrous, ovules 9–12 mm, style 19–20 mm long, filiform, papillose below the stigma, stigma capitate, included. *Fruit* ovoid, 8–9 × 6–7 mm wide; seeds 5, 4–5 mm long. Figure 38.

*Cestrum olivaceum* is distinctive in its dense overall brownish yellow pubescence and lilac flowers.

**Distribution** (Fig. 39). Táchira. Cloud forests along ravines and disturbed forest margins; 2150 to 2450 m. Also in the Department of Santander, Colombia.

**Phenology.** Of the two collections seen, one was in flower in April and the other in fruit in July.

**Additional specimens seen.** VENEZUELA. **Táchira:** Parque Tamá, zona de Buena Vista, 5–6 km arriba de San Vicente de La Revancha, *Morillo & García 11478* (MERF, MY); Quebrada Azul, S of El Reposo, 14 km SE de Delicias, *Steyermark & Liesner 118501* (MO, VEN).

**20. *Cestrum pariense*** Steyer., *Acta Bot. Venez.* 1(2): 62. 1966. TYPE: Venezuela. Sucre: Cerro Patao, N de Puerto de Hierro, NE de Güiria, 850 m, *Steyermark & Agostini 91026* (holotype, VEN; isotype, US).

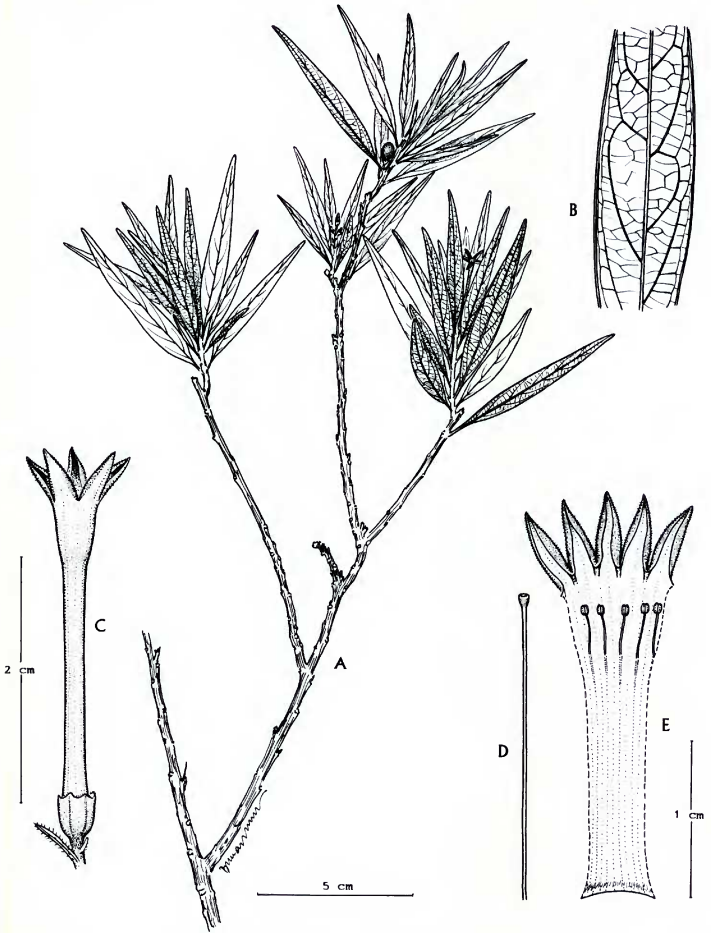


Figure 34. *Cestrum neblinense*.—A. Branch with fruit.—B. Detail of leaf venation.—C. Flower.—D. Style and stigma.—E. Corolla opened to show stamens. After Liesner 1661 (MY).

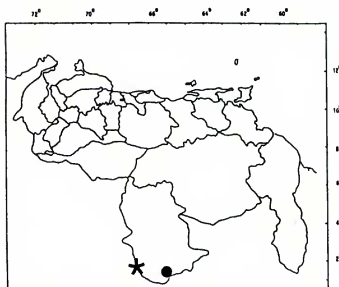


Figure 35. Distribution of two localized species of *Cestrum*. Circle = *Cestrum neblinense*. Star = *Cestrum schulzianum*.

*Shrub or subshrub* 0.6–2.5 m tall, stems fleshy, young parts pilose, glabrescent; pubescence of reduced, crinkled, simple and branched hairs. *Leaves* elliptical, 10–25 × 6–10 cm, apically acute or short-acuminate, basally cuneate, firmly membranous, sometimes fleshy or coriaceous, dark green above, pale beneath, glabrous, veins 6–9 on each side, salient beneath; petiole purple, 1–3.5 cm long, puberulous; minor leaves wanting. *Inflorescences* axillary, peduncles solitary, 2.5–4 cm long, 1–4-flowered, pendulous or erect, elongated in fruit, puberulent; bracts foliaceous, folded upward along the costa and covering the sides of the calyx, pilose, especially along the costa beneath, 7–10.5 mm long, 5–6(–10.5) mm wide. *Flowers* nocturnal, 29–31 mm long, sessile; calyx cupular, 3–3.5 × 2 mm, sparingly pilose, inconspicuously 5-costate, tube 2.5–3 mm long, 5-toothed, the teeth 0.5 mm long, narrowly triangular, ciliate, tufted; corolla greenish white, 28–31 mm long, glabrous, subfunnel-form, tube contracted around the ovary, abruptly expanded toward the apex, 5-lobed, mouth 2.5 mm wide, lobes 6.5–8 × 1.5–2.5 mm, ciliate, folds puberulent; stamens 16–17 mm long, filaments glabrous, adnate for 13.5–14 mm, 1–1.5 mm free, insertion straight, smooth, anthers suborbicular, 0.8 mm across; ovary subglobose, 1–1.5 mm across, glabrous, ovules 6–8, style 15.5–16.5 mm long, exerted 0.5 mm, papillose 1 mm below the stigma then short-pilose 2 mm further down, stigma bilobed, 1 mm long. *Fruit* dark purple, compressed-globose, 14–15 × 10–13 mm wide; seeds 7, 6.5 mm long. Figure 40.

This species is similar to *Cestrum bigibbosum* in its habitat and in the length of its corolla lobes.

Small (to 1 m) plants are similar in aspect. However, flowers of *C. pariense* are elevated on slender peduncles and have much smaller calyces.

*Distribution* (Fig. 23). Sucre. Evergreen forests and river banks; 600–1400 m. Apparently endemic to the Paria Peninsula.

*Phenology*. Collected in flower in July and in fruit in February and March.

*Additional specimens seen*. VENEZUELA. Sucre: P. Nacional Peninsula de Paria, La Pava, Municipio Mariño, Benítez et al. 5130 (MY); Cerro de Humo o Terrón de Azúcar, NE de Irapa, Fernández 3154 (MY); Cerro de Humo, NE de Irapa, Steyermark 95075 (VEN), 95076 (US); Río Tacarigua and headwaters of Río Tacarigua, E of Cerro Humo, N of Río Grande Arriba, Steyermark et al. 121595 (MO. VEN).

**21. *Cestrum petiolare*** Kunth, in Humb., Bonpl. & Kunth, Nov. Gen. Sp. 3: 58. 1818. *Sessea petiolaris* (Kunth) Spreng., Syst. Veg. 1: 584. 1825. SYNTYPES: Peru. Between Ayavaca and Yanta, 800 hex, *Humboldt 1409* (P-Bonpl. not seen, = microfiche 63-1-4, = F photo 39046, B destroyed, = F photo 3020).

*Cestrum petiolare* Willd. ex Roem. & Schult., Syst. Veg. 4: 807. 1819. TYPE: Amer. Merid. *Humboldt s.n.* (holotype, B-W 4438 not seen, = IDC microfiche).

*Cestrum caloneurum* Pittier, J. Wash. Acad. Sci. 22: 31. 1932. TYPE: Venezuela. Aragua: Colonia Tovar, 1800–1900 m, *Pittier 10045* (holotype, VEN; isotypes, G-DC, US).

*Cestrum calycosum* Pittier, J. Wash. Acad. Sci. 22: 31. 1932. TYPE: Venezuela. Aragua: Colonia Tovar, 1800–2000 m, *Allart 480* (holotype, VEN).

*Shrub or small tree* 4–5(–8) m tall, 5 cm DBH, bark smooth, dark green to gray with prominent lenticles, branches flexuous, young parts often puberulent; pubescence of dendritic white or yellow hairs. *Leaves* malodorous, conspicuously revolute, narrowly elliptical or narrowly ovate, sometimes oblique, (7–)16–22(–29) × (3.5–)5–8(–11) cm, apically acute, often shortly and narrowly prolonged, basally obtuse or narrowly cuneate, sometimes almost truncate, firmly papery to subcoriaceous, above yellowish green, matte, beneath paler, somewhat shiny, veins 14–21(–26) on each side, parallel and ascending near the margins, sunken above, some pustular, purplish beneath, and the minor venation mostly elevated, often appearing pulverulent; petiole purplish on young leaves, green when mature, flexuous, canaliculate, 2–4.5 cm × 1.2–1.5 mm; minor leaves 7–15 × 5–8 mm, sessile, amplexicaulous, sometimes falcate, pointed, glabrous, often caducous, sometimes wanting on mature branches. *Inflorescences* axillary and terminal, form-

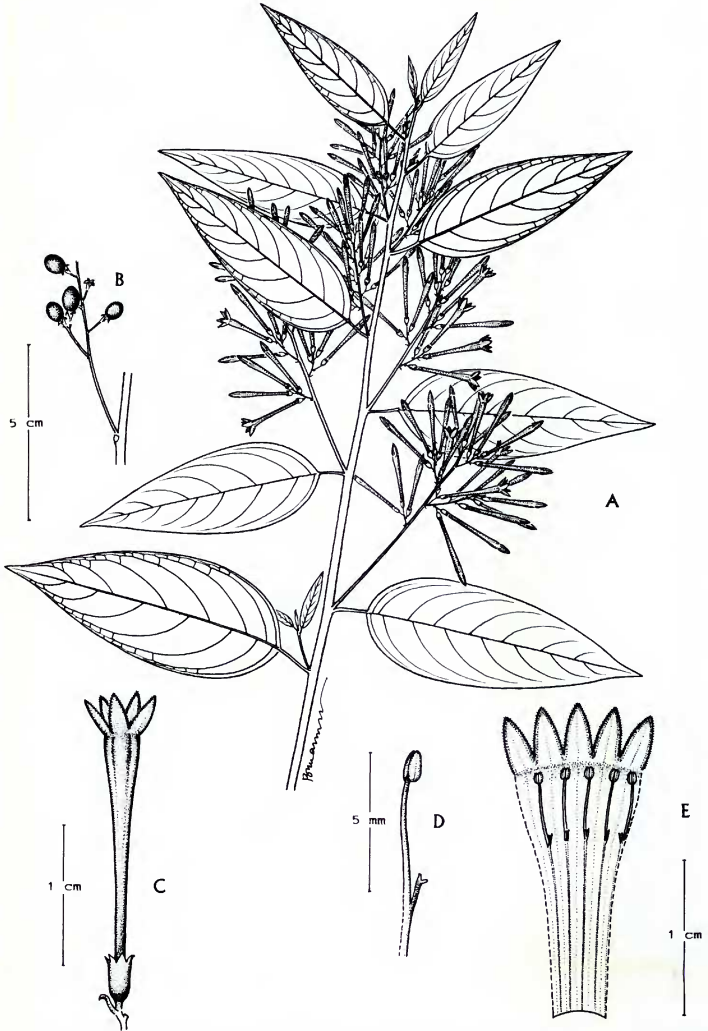


Figure 36. *Cestrum nocturnum*.—A. Flowering branch.—B. Twig with fruits.—C. Flower.—D. Stamen.—E. Corolla opened to show stamens. After Benítez 1034 (MY).

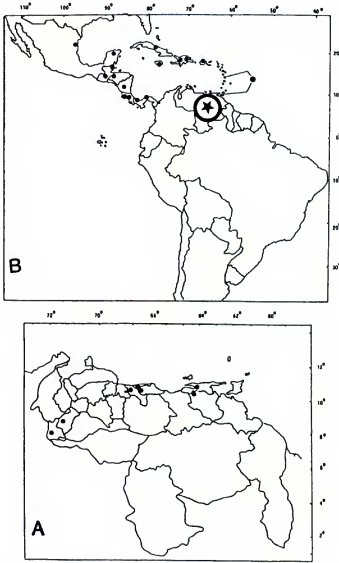


Figure 37. *Cestrum nocturnum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

ing lax, paniculate clusters between the branches, sometimes enlarged panicles 5–8(–13) cm long, flexuous, axes angular and pulverulent. Flowers diurnal, fragrant, 20–24 mm long, sessile, bracteoles linear-subulate, deciduous, 5 mm long; calyx bright green, tubular, 7–10.5 × 3.5–4 mm, inconspicuously 5-costate, coriaceous, thick, glabrate outside and puberulent inside, especially on the veins within, tube 6–9 mm long, 3–5-toothed, teeth unequal, 1–1.5 mm long, ciliate and apically pubescent; corolla yellow, yellowish green, or greenish white, 18–23 mm long, clavate, tube obconical, gradually expanded upward, barely contracted below the ovary and lobes, glabrous, mouth 3.5–4.5 mm wide, the lobes narrowly ovate, ciliate, apically mucronate, 2.5–4.5 mm long; stamens 12–16 mm long, filaments adnate for 5.5–9.5 mm, pilose 2–5 mm from the base or to the insertion, insertion geniculate-tumid, pilose, 1.5–2.5 mm long, free part 4.5–9.5 mm, anthers orbicular, 0.5 mm across; ovary ovoid or subglobose, 1–2 × 1.5–2 mm, glabrous, disk conspicuous, ovules 8–32, style 14–18 mm

long, bright dark green, glabrous, stigma bright green, capitate, 0.5 mm long, slightly exerted. Fruit narrowly ellipsoidal, dark purple, 13–25 × 5–12 mm, pulp whitish, 1.7 mm thick; fruiting calyx enclosing about half of the fruit; seeds (6–)18–31 per fruit, brownish yellow, 2.5–3 mm long (Croat 54936), embryo white, straight. Figures 1A, 41.

*Cestrum petiolare*, with its broad corollas and numerous veins on the leaves, resembles *C. lindenii*, but it differs in its pubescence of dendritic rather than simple hairs on twigs and leaf undersides, and in usually having much larger calyces. This species commonly has many more ovules than any other species in the genus.

Francey (1935: 390) referred the unpublished name "*Cestrum moritzianum* Klotzsch & Karsten," used on a manuscript in Berlin, to this species.

**Distribution** (Fig. 42). Aragua, Mérida, Miranda, Táchira, Trujillo, and the Distrito Federal. Transitional cloud forests, dwarf cloud forests, and near ravines on paramo; 1120–3200 m. Also in Colombia and Peru.

**Phenology.** Flowering year-round except in July, mainly from January to April and in August. Fruiting is year-round.

**Common names.** Borrachero, Tabacón, Tütiera, Uvito de árbol.

**Representative specimens seen.** VENEZUELA. **Aragua:** entre El Lagunazo y Colonia Tovar, Fernández 856 (MY). **Mérida:** Río Los Granates, páramo de Los Granates, López-Figueiras 8754 (MERF, MY). **Miranda:** Pico de Naiguatá, el fondo de la quebrada Rancho Grande, Meier 3330 (MY, VEN). **Táchira:** Carretera Seboruco–El Suspiro, Benítez & Rojas 4746 (MY). **Trujillo:** Carretera Tuñame–Jajó, Aristeguieta & Medina 3689 (NY, US, VEN). **Distrito Federal:** entre La Rosita y El Portachuelo, Benítez 1438 (VEN).

**22. *Cestrum potaliifolium*** Dunal, in A. DC., Prodr. 13(1): 638. 1852 [*potalaefolium*]. TYPE: Venezuela. Aragua: Colonia Tovar, Moritz 824 (holotype, G-DC, = IDC microfiche; isotypes, B destroyed, = F photo 2991, BM).

*Cestrum tovarense* Francey, Candollea 6: 388. 1935. TYPE: Venezuela. Aragua: Colonia Tovar, Fendler 962 (holotype, NY; isotype, GH).

Shrub or tree to 5 m tall, 6 cm DBH, stems straight, slightly branched, ridged and grooved, with dispersed glands, young growth pulverulent or puberulent with a purplish hue; pubescence of simple reduced hairs. Leaves inodorous, ovate or elliptical, rarely obovate, 10–28 × 5–12 cm, apically acute, basally unequal or rounded, rarely narrowly

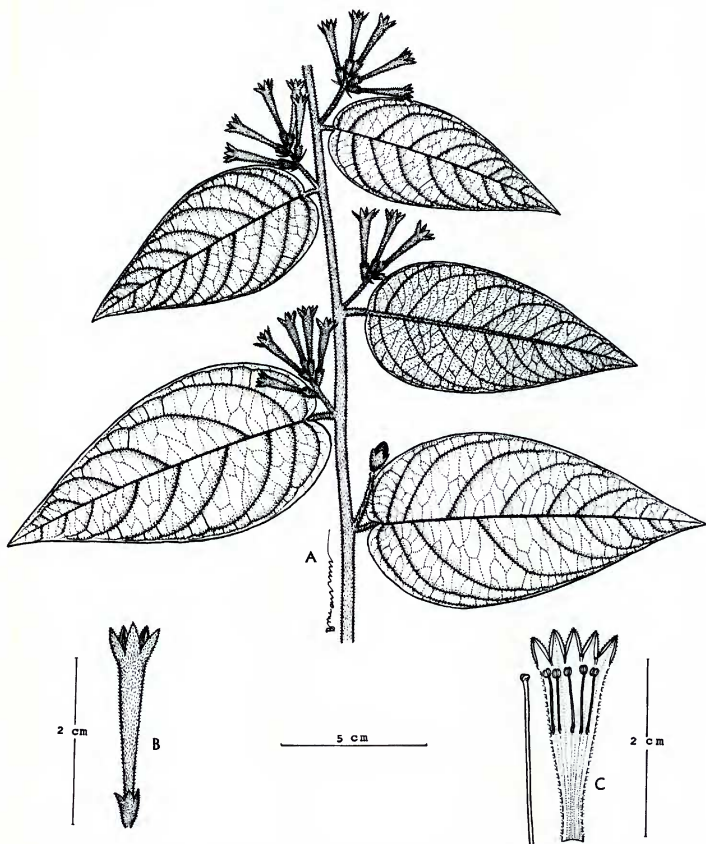


Figure 38. *Cestrum olivaceum*.—A. Branch with flowers and fruit.—B. Flower.—C. Corolla opened to show stamens and style. After Morillo & Garcia 11478 (MY).

cuneate, the margin sometimes retracted between the main lateral veins and appearing dentate or erose, slightly revolute, lamina coriaceous or subcoriaceous (papery when living), bright dark green above, pale yellowish green beneath, drying yellow, glabrate, sometimes with scarce minute glands beneath, veins 6–10 on each side, ascending, slightly prominent above, elevated beneath, and the minor

venation reticulate, inconspicuous when alive; petioles flat-topped, distally canaliculate, flexible in mature leaves, 1.2–2.5 cm long, glabrous, the insertion at the stem often expanded into a rounded pillow-like form; minor leaves wanting. *Inflorescences* axillary, clustered. *Flowers* 20–24 mm long, sessile or with pedicels 0.5 mm long, bracteoles linear, arching, 2–4.5 × 0.5–1 mm, puberulent; ca-

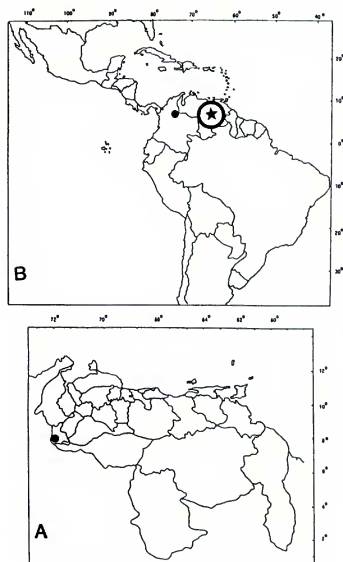


Figure 39. *Cestrum olivaceum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

lyx cupular, 4–5.5 × 2 mm, slightly coriaceous, rugose, glabrous or sparingly puberulent, tube 3–4.5 mm long, 5-dentate, teeth narrowly ovate, 1–2 mm long, apically cuspidate, pilose and with sparse dispersed glands; corolla greenish white or pale yellow, 18–23 mm long, narrowly funnelliform, tube gradually expanded upward, slightly contracted at the ovary, mouth 2–2.5 mm wide, lobes 3.5–4.5 mm long, narrowly ovate, apically obtuse; stamens 13.5–15.8 mm long, filaments adnate for 9–11 mm, sparingly pilose from the base to the insertion, straight, barbate, free part 4–5 mm, anthers suborbicular, 0.5 mm across; ovary globose or elliptical, 0.8–1 mm across, glabrous, disk conspicuous, style 12–15 mm long, exerted 0.5 mm, stigma capitate. *Fruit* purple, obovoid to ellipsoid, 8–12 × 7–9 mm wide; seeds 6–8, dark brown, 7–7.5 mm long. [Francy 7: 65.] Figure 43.

*Cestrum potalifolium* is similar to *C. megalophyllum* but is distinct in its often yellowish leaves and in the expansion of the stem around many of

the petiole bases into a conspicuous, often pillow-like ridge.

In the original publication, Dunal erroneously cited the type collection as being from Colombia.

*Distribution* (Fig. 44). Aragua and the Distrito Federal. Endemic to Venezuela. Found in evergreen cloud forests; 1000 to 2000 m.

*Phenology*. Collected in flower from June to October, mainly in June. Fruiting collections have been made from September to January, mainly in January.

*Representative specimens seen*. VENEZUELA. Aragua: entre Las Marochas y Choroni, Bentz et al. 4912 (MO, MY); Portachuelo forest, Wood 322 (VEN). Distrito Federal: E of Junquito, Steyermark 57006 (MY, VEN).

**23. *Cestrum racemosum* Ruiz & Pav., Fl. Peruv. 2: 29, pl. 154. 1799. TYPE: Peru. Chin-chao and Macora, Ruiz *s.n.* (holotype, F).**

*Cestrum matheusii* Dunal, in A. DC., Prodr. 13(1): 637. 1852. SYNTYPES: Peru. Chachapoyas: *Matheus s.n.* (MPU, G, neither seen, US).

*Cestrum panamense* Standl., J. Wash. Acad. Sci. 15: 460. 1925. *Cestrum racemosum* var. *panamense* (Standl.) Francy, Candollea 6: 274. 1935. TYPE: Panama. Río Tapia, Standley 28042 (holotype, US).

*Cestrum grande* Pittier, J. Wash. Acad. Sci. 22: 32. 1932. *Cestrum racemosum* var. *grande* (Pittier) Francy, Candollea 6: 275. 1935. TYPE: Venezuela. Distrito Federal: Curucuf, 400 m, on old road from Caracas to La Guaira, Pittier 10393 (holotype, VEN; isotypes, GH, NY, US).

*Cestrum racemosum* var. *bolivianum* Francy, Candollea 6: 274. 1935. SYNTYPES: Bolivia. Santa Cruz: Bosques del Fraile, Buenavista, 450 m, Steinbach 7259 (B not seen, MO, S not seen).

*Trees* 6–20(–25) m tall, trunk 12(–60) cm DBH, grayish green, straight, branching with a narrow crown, wood soft and whitish, stems lenticellular, young growth sparingly puberulent; pubescence of simple, white, moniliform ascending and crumpled hairs. *Leaves* malodorous, spreading, ovate 11–19 (–22) × 2.5–7(–9) cm, apically acute or acuminate, base rounded, membranous, slightly sticky to touch, matte dark green above, pale yellowish green beneath, glabrate with a few scattered hairs above, when mature glabrous and often lenticellate beneath, veins (10–)15–22(–27) on each side, equally spaced and arcuate-ascending at (62°–)70°(–75°), prominent beneath; petioles canaliculate, 0.7–2 cm long; minor leaves absent. *Inflorescences* mostly axillary clusters of short racemes, peduncles 1.5–2.5 cm long, sparingly pilose. *Flowers* greenish white or yellowish green, the apex sometimes slightly purple, 14–20 mm long; pedicels 1–2 mm long, pubescent; bracteoles 1–2.7 mm long, linear, pubes-



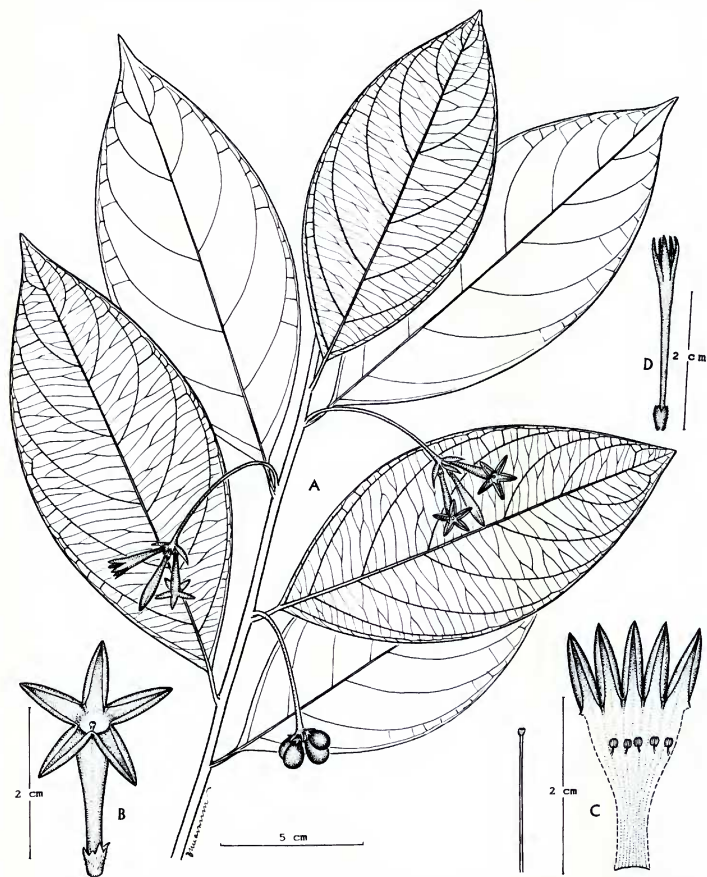


Figure 40. *Cestrum parieense*.—A. Branch with flowers and fruit.—B. Fully opened (night) flower.—C. Corolla opened to show stamens and style.—D. Closed (day) flower. After Benítez 5130 (MY).

cent; calyx cupular, 1.7–3.6 × 1–1.5 mm, basally narrowed into a stipe, 5–6-costate, membranous, pilose outside, tube 1.5–2.8 mm long, 5-dentate, teeth 0.2–0.8 mm long, pilose outside on the veins and the tips; corolla narrowly funnellform, 13–18 mm long, tube gradually expanded upward, slightly contracted below the ovary, mouth 1.5 mm wide,

lobes triangular, ± acute apically, folds pilose, 2–3.5 mm long; stamens 10.5–12.5 mm long, filaments adnate for 8–12 mm, with sparse hairs from the base to 1.5–2.5 mm below the insertion, the base glabrous or pubescent, insertion straight, smooth, free part 1.5–2.5 mm, anthers spherical, 0.2–0.5 mm across; ovary 1–1.5 × 0.5–0.8 mm,

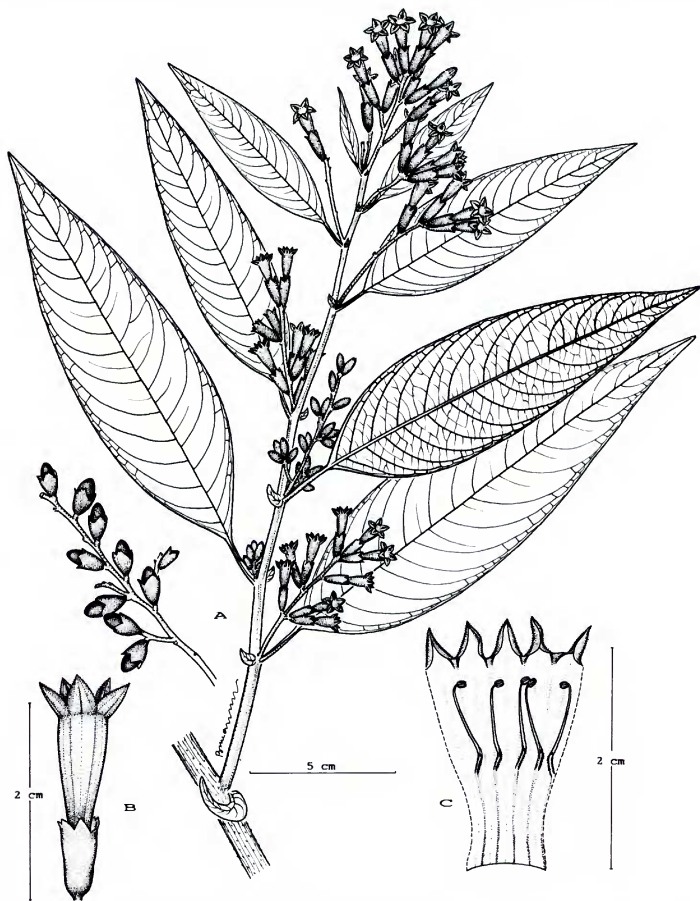


Figure 41. *Cestrum petiolare*.—A. Branch with flowers and fruit.—B. Flower.—C. Corolla opened to show stamens. After Benítez 4739 (MY).

glabrous, disk inconspicuous, ovules 4–7, style 9–12.5 mm long, papillose below the stigma, stigma capitate, included. *Fruit* purple, globose, 5–6 mm long, 3–5 mm wide; fruiting calyx accrescent and cupulate; seeds 3–7 per fruit, brown, 3 mm long

(after Greenman 5218), embryo white, 1.5 mm long. Figure 45; D'Arcy, 1974: 609, figure 5.

*Cestrum racemosum* may be recognized by its usually arborescent stature and usually narrow

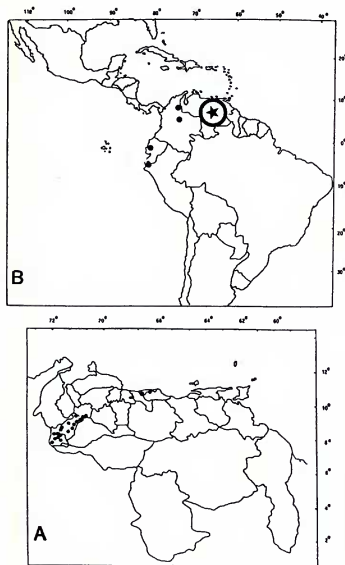


Figure 42. *Cestrum petiolare*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

leaves with numerous, evenly spaced veins, which are salient on the leaf undersides.

**Distribution** (Fig. 46). Amazonas, Anzoátegui, Aragua, Barinas, Falcón, Lara, Mérida, Miranda, Portuguesa, Táchira, Yaracuy, Zulia, and the Distrito Federal. Evergreen forests, secondary forests, and gallery forests; 400–2200 m. Also occurring from Mexico to Bolivia.

**Phenology.** Flowering and fruiting year-round with maxima in the first half of the year.

**Common names and uses.** Used to shade coffee plants, sometimes cultivated in parks and gardens.

**Representative specimens seen.** VENEZUELA. **Amazonas:** Cerro de la Neblina, *Euel* 195 (MY). **Anzoátegui:** Río Maravilla, E. of Bergantín, *Steyermark* 61711 (MY, VEN). **Aragua:** Carretera Maracay–Choroní, *Benítez & Rojas* 4996 (MY). **Barinas:** Barrancas, *Marciano-Berti & Torres-Lozana* 207 (MER, VEN). **Falcón:** La Chapa, Sierra de San Luis, *van der Werff* 241 (MO, WIS). **Lara:** Paso de Angostura, represa de Yacambú, confluencia de la Quebrada Honda con el Río Yacambú, *Steyermark* &

*Carreño Espinoza* 108771 (VEN). **Mérida:** entre San Jacinto y Tienditas del Chama, *Quintero* 526 (MER); La Punta, *Ricardi & Salcedo* 5744 (MER), 5756 (MER). **Miranda:** Hacienda de café Turgua, *Aristeguieta* 2769 (NY, US, VEN). **Portuguesa:** Pueblo de Anzuátegui, *Smith* 7153 (VEN). **Táchira:** La Petrolea, carretera Rubio–San Vicente de la Revancha, *Benítez et al.* 4864 (MY). **Yaracuy:** El Chorro, entre La Chapa y Uria, en la vía hacia Curimagua, *Benítez et al.* 5151 (MY). **Zulia:** Cerro Sasa, *Steyermark* 99894 (MO, US, VEN). **Distrito Federal:** between Caracas and La Guaira, *Fendler* 961 (GH).

**24. *Cestrum reflexum* Sendtn., in Mart., Fl. Bras. 10: 218. 1846. TYPE:** Bolivia [Brazil]. Chiquitos, *Orbigny* 659 (lectotype, here designated, P).

*Cestrum floribundum* Britton, Mem. Torrey Bot. Club. 6: 92. 1896. TYPE: Bolivia. La Paz: Guanai–Tiquani, Apr.–June 1892, *Bang* 1470 (MO, NY not seen).

*Cestrum reflexum* var. *densiflorum* Francey, Candollea 6: 267. 1935. SYNTYPES: Bolivia. Santa Cruz: bosque de Buenavista, 450 m, *Steinbach* 1480 (B destroyed), 3216 (B destroyed), 6172 (MO, B destroyed, S not seen), 7162 (MO, B destroyed, S not seen).

Climbing *shrub* 2–3 m tall, branches flexuous, puberulent; pubescence of simple and sparingly branched, often cobwebby hairs. *Leaves* often drying grayish, ovate or narrowly ovate, 4.5–11 × 2–6 cm, apically acuminate, the tip acute or obtuse, basally rounded, sometimes short-decurrent on the petiole, membranous, shiny green and puberulent on both sides, 7–8 veins on each side, minor veins impressed above; petiole 1–1.3 cm long, at insertion slightly bent and hooked, slightly thickened and densely tomentose; minor leaves not seen. *In-florescences* leafy axillary or terminal racemes and panicles, axes 3–5 cm long, pubescent; bracts foliaceous, reduced upward. *Flowers* whitish or yellowish, 25–29 mm long, pedicels obsolete, bracteoles 3 mm long, pilose; calyx cupular, 2.5–4.5 × 1.5 mm, inconspicuously costate, pilose at the level of the teeth, tube 1.5–3.5 mm long, the teeth 1 mm long, narrowly triangular, ± reflexed, pilose inside and out, ciliate, tufted; corolla 24–27 mm long, glabrous, tube contracted below the ovary, cylindrical, suddenly expanded apically, mouth 1.5–2 mm wide, lobes 4–6 mm long, narrowly ovate, folds and margin puberulent; stamens 19–19.5 mm long, filaments adnate for 18.5 mm, glabrous, insertion straight, smooth, free part 0.5–1 mm, glabrous, anthers rotund, 0.5 mm across; ovary 0.5–1 mm long, glabrous, disk conspicuous, 0.5 mm long, ovules 10–14, style 19–19.5 mm long, stigma bilobate, exerted 1 mm. *Fruit* dark purple, ellipsoidal, 6.5–7(–10) × 5 mm wide; fruiting calyx often drying dark, sometimes flaring; seeds 6–14, light brown,

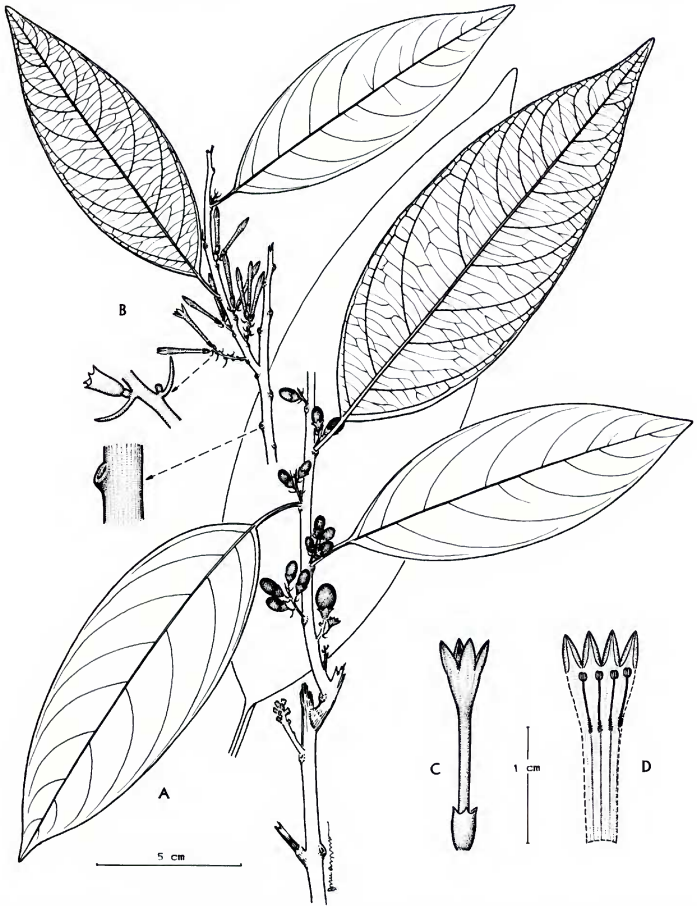


Figure 43. *Cestrum potaliifolium*.—A. Fruiting branch.—B. Flowering branch.—C. Flower.—D. Corolla opened to show stamens. After Steyermark 57006 (VEN).

4–4.5 mm long. [Francey 6: 265.] Figure 47; D’Arcy, 1974: 611, figure 6.

Herbarium specimens of *Cestrum reflexum* are often best recognized by their grayish color and

small but persistent, foliaceous bracts. The plant is a scrambler.

*Distribution* (Fig. 44). Bolivar; 290 m. Also in

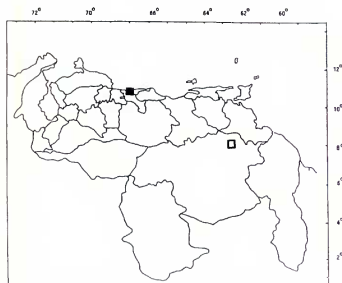


Figure 44. Distribution of two localized species of *Cestrum*. Solid square = *Cestrum potaliifolium*. Open square = *Cestrum reflexum*.

Nicaragua, Costa Rica, Panama, Colombia, Ecuador, Peru, Bolivia, and Brazil. The species may be native to Brazil.

**Phenology.** The sole collection from Venezuela was flowering in February.

Outside of Venezuela, *Cestrum reflexum* is an uncommon species found from 50 to 300 m in gallery forest, rainforests, and disturbed areas.

**Specimens seen.** VENEZUELA. Bolívar: Camino a la estación Magdalena, El Palmar, NE, Bernardi 7127 (MER, VEN).

**25. *Cestrum ruizteranianum*** Benítez & D'Arcy, *Novon* 5: 313. 1995. TYPE: Venezuela. Mérida: Distrito Rangel, trail from La Negrita downstream towards Puente de La Escalera, montane cloud forest, 2550–2950 m, Luteyn et al. 6171 (holotype, NY; isotypes, MY, VEN).

**Shrub** 1–4 m tall, erect, branched, young stems angular, terete when mature, scurfy pubescent; pubescence of dark, crinkled, perhaps branched hairs. **Leaves** narrowly elliptical to elliptical, 4–6 × 1.5–3 cm, apically acute or obtuse, basally obtuse, margins slightly revolute, firmly membranous, glabrous on both sides except for some scurfy hairs on minor veins, the major veins impressed above, elevated beneath, 8–10 on each side, ascending, looping and uniting near the margins; petioles 6–8 mm long, slender, inrolled, tomentulose above; minor leaves sometimes present, ovate, 10–13 × 5–7 mm, with petioles 0.5–1 mm long. **Inflorescences** axillary racemes, sometimes appearing as terminal panicles, 2.5–6 cm long; peduncles 0.7–5 cm long; bracts 1.5–2.5 mm, linear. **Flowers** 22–26 mm long, pedicels obsolete; bracteoles linear, 3 mm long,

sparingly pubescent, caducous; calyx drying dark brown, tubular, 6–8 × 3–3.5 mm, faintly striate, thick, glandular and with sparse hairs outside, pubescent within and with glandular hairs halfway down, 5-toothed, the teeth 2 × 2 mm; corolla pale green, purplish outside, pale yellowish green inside, 20–26 mm long, exerted ca. 19 mm from the calyx, the tube 17–20 mm long, 3–3.5 mm at its widest, contracted around the ovary and then gradually expanded upward, the throat not constricted, mouth 3.5–4 mm wide, lobes 3–5 × 1.5–2 mm, narrowly triangular-acuminate, sometimes sparingly pubescent, the folds tomentose; stamens 15.5–19 mm long, adnate for 7–9 mm, the adnate portion pubescent for the basal 3–4 mm, insertion geniculate-tumid, 1.5–2.5 mm long, free part 7.5–9.5 mm, anthers orbicular, 1 mm across; ovary lobed, 0.7 mm across, glabrous, ovules 16–18, papillose 4–5 mm below the stigma, exceeding the stamens by 1.5 mm, style 15–19 mm, stigma subcapitate, slightly bilobed, included. **Fruit** unknown. Figure 48.

*Cestrum ruizteranianum* is very like *Cestrum lindeni* but differs in its uniformly smaller leaves, larger flowers, and glandular calyces.

**Distribution** (Fig. 23). Mérida. Montane cloud forest; 2950–2550 m. Endemic.

**Phenology.** Collected in flower in November.

**Additional specimens seen.** VENEZUELA. Mérida: Cavidia, Dist. Rangel, Ruiz-Terán et al. 16171 (MERF, MY), 16154 (MY).

**26. *Cestrum salicifolium*** Jacq., *Pl. Hort. Schoenbr.* 3: 42, pl. 326. 1798. TYPE: from “Caracas,” pl. 326 in Jacquin, 1798 (lectotype, here designated).

*Cestrum salicifolium* var. *angustifolium* Dunal, in A. DC., *Prodr.* 13(1): 670. 1852. TYPE: cultivated in Europe as *C. salicifolium* in herb. Reuquen (MPU not seen).

**Shrub** or **tree** 1.5–5 m tall, trunk very slender, sometimes arching, 5–8 cm DBH, branching high on the trunk, branches narrow, often hanging, purple when young, twigs slender, purplish, the epidermis longitudinally striate; pubescence of simple, multicellular hairs, evident only on bracts and perhaps emerging growth, plants otherwise glabrous. **Leaves** narrowly elliptical, 7–15 × 0.8–3 cm, narrowing upward, base obtuse or acute and ± decurrent on the petiole, margin slightly revolute, membranous to subcoriaceous, glabrous, veins 16–18 (–30), arising nearly perpendicular to the costa, appearing straight and evenly spaced, furcating near the margin and forming a partial, undulating submarginal vein, reticulate venation plane above,



Figure 45. *Gestrum racemosum*.—A. Branch with flowers and fruits.—B. Flower.—C. Corolla opened to show stamens. After Morillo & Manara 2135 (VEN).

mostly not evident, the costa and sometimes major lateral veins elevated beneath; petiole flat-topped, distally canaliculate, 0.4–1 cm long, often curving and twisting depending on orientation of the stem, leaf scars discoid; minor leaves wanting. *Inflores-*

*cences* axillary and terminal, lax panicles of racemes, 10–12 (5.5–9) cm long, not leafy; peduncles purple, 1–2 cm long, 0.5–1 mm thick, glabrous, unbranched or 2–3-branched, ultimate segments resembling the pedicels, 1–7 mm long, the distal

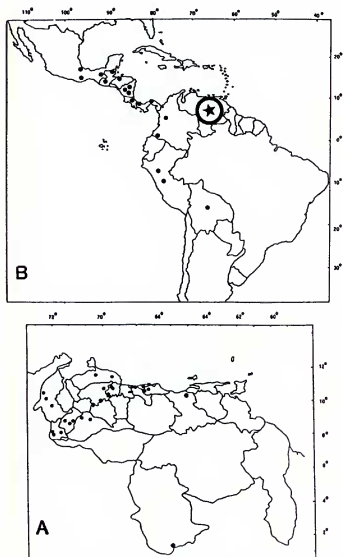


Figure 46. *Cestrum racemosum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

ones usually shortest; bracts linear, 2–6 mm long, inserted at base of the rachis, the branches, and along the peduncle and rachis branches. *Flowers* 25–32 mm long, buds purple; pedicels 0.5–5 mm long, articulated, bracteoles filiform, 1–5 mm long, puberulent with weak caducous simple hairs that dry appearing moniliform; calyx tubular, 3.5–5 × 2 mm, subcoriaceous, wrinkled, venation obscure or evident on the lobes, tube 3–4 mm long, 5-dentate, pilose, teeth deltoid, 0.5–0.8 mm long, minutely ciliate and tufted; corolla greenish white, 26–31 mm long, funnellform, tube slender, slightly contracted above the ovary, then gradually expanded toward the apex, (10–)13–15 mm long, mouth 1.5–2 mm wide, teeth narrowly acute, 4–6(–8) mm long, ciliate, folds pubescent; stamens inserted 0.5 mm apart, 18–21 mm long, filaments adnate for 14–20 mm, glabrous, insertion free 0.5 mm, straight, pilose, gibbose (with a tooth 1 mm long), free part 3–5 mm, anthers globose, 0.5 mm across; ovary 0.6–1 mm across, papillose, ovules 8–10, style 18–21 mm long, papillose below the stigma, stigma

subcapitate, exerted 0.5 mm. *Fruit* dark purple, ellipsoidal, (8–)10–15 × 6.5–10 mm, stalked, pulp fleshy; fruiting calyx flaring, conspicuously wrinkled, not splitting; seeds 6–9, dark brown, 3.5–5 m long. [Francey 6: 359.] Figure 49.

*Cestrum salicifolium* is a slender treelet with arching crown and branches and narrow, membranous leaves. The inflorescences are open and pendent. Specimens are often very like narrow-leaved examples of *C. bigibbosum*, but the bracteole (or articulation) along the flower stalk is distinctive.

With its saliciform leaves and aspect, this species appears to be a rheophyte, adapted to inundation in periodic torrents that flood narrow watercourses.

A specimen of *Cestrum salicifolium*, labeled as having been collected by Sintenis in November 1886 in open woods at Bayamon, Puerto Rico, is deposited at Hamburg (HBG). That the species is otherwise known only from Venezuela, where it is confined to narrow ravines, casts doubt on the provenance of this specimen. Although Sintenis is not known to have visited Venezuela, the specimen is labeled "ex Herbario Reineck," a possible setting for a mix-up in label data.

*Cestrum salicifolium* var. *angustifolium* Dunal was placed in synonymy of Francey (1935: 359).

*Distribution* (Fig. 50). Carabobo, Miranda, and the Distrito Federal. Cloud forests and ravines; 1300–1800 m. Probably endemic to the Caribbean region of Venezuela.

*Phenology*. Flowering takes place mainly in November and December and fruiting in December and April, but some flowering takes place in other months. Flowers are open at night, with the corolla lobes spreading, and are closed during the day. They are strongly scented when open. Nectar was not detectable.

*Representative specimens seen*. VENEZUELA. **Aragua:** Carretera Maracay–Choroní, Benítez et al. 4907 (MY). **Carabobo:** Cuenca hidrográfica del Río Morón, carretera hacia La Justa, Díaz 526 (MO). **Miranda:** Quebrada de las Comadres cerca de Las Mostazas, Allart 254 (NY, US, VEN). **Distrito Federal:** Cordillera del Avila above Caracas, Steyermark 55008 (MY, VEN).

27. *Cestrum scandens* Vahl, *Eclog. Amer.* 1: 24. 1797. TYPE: Colombia. Santa Marta: von Rohr s.n. (holotype, C not seen, = IDC microfiche, = F photo 22927).

*Cestrum paniculatum* Kunth, in Humb., *Bonpl. & Kunth*, *Nov. Gen. Sp.* 3: 62. 1818. TYPE: Venezuela. Distrito Federal: banks of river Guayre near Caracas.

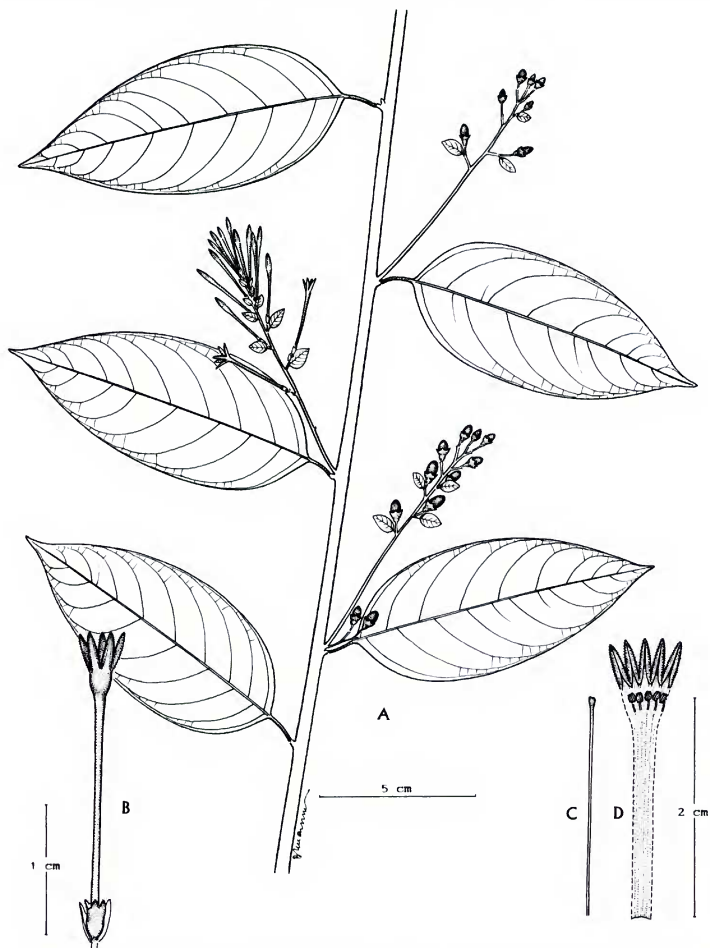


Figure 47. *Cestrum reflexum*.—A. Branch with flowers and fruits.—B. Flower.—C. Style.—D. Corolla opened to show stamens. After Bernardi 7127 (MER).





Figure 48. *Cestrum ruizteranianum*.—A. Flowering branch.—B. Flower.—C. Corolla opened to show stamens and style. After Luteyn 6171 (NY).

alt. 420 hex. *Humboldt s.n.* (holotype, B-W 4453, = IDC microfiche, = F photo 2989).  
*Cestrum laxiflorum* Dunal, in A. DC., Prodr. 13(1): 655. 1852. TYPE: Venezuela. *Moritz 212* (holotype, G-DC, = IDC microfiche; isotypes, B destroyed, = F photo 2985, BM).  
*Cestrum scandens* var. *terminale* Dunal, in A. DC., Prodr. 13(1): 665. 1852. *Cestrum terminale* (Dunal) Pittier,

J. Wash. Acad. Sci. 22: 33. 1932. TYPE: Colombia. Santa Marta: *Bertero s.n.* (holotype, G-DC, = IDC microfiche).  
*Cestrum perilambanon* Loes., Verh. Bot. Vereins Prov. Brandenburg 65: 98. 1923. TYPE: Guatemala. *Seler 3381* (B? destroyed; F, fragment).

Climbing shrub 2.5–4 m tall, main stem erect,

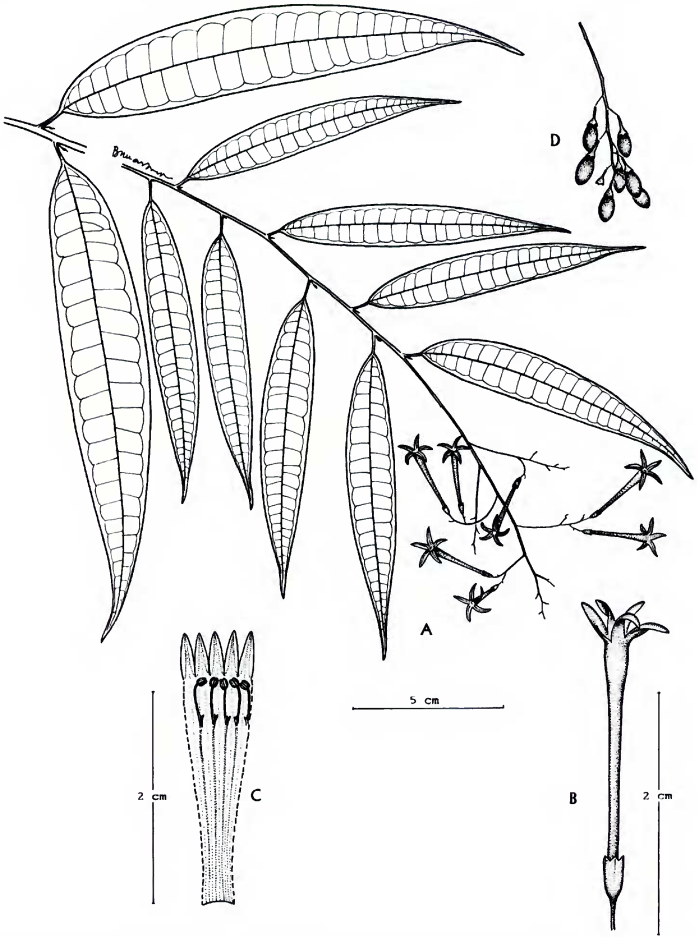


Figure 49. *Cestrum salicifolium*.—A. Flowering branch.—B. Flower.—C. Corolla opened to show stamens.—D. Fruits. After *Manara 65436* (MY).

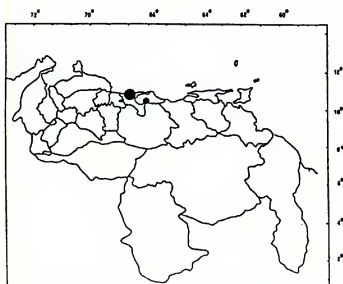


Figure 50. *Cestrum salicifolium*. Distribution in Venezuela.

branches high-climbing or decumbent, terete, mostly glabrous; pubescence of reduced simple hairs. *Leaves* ovate, 5.5–13 × 2.4–8 cm, apically acute or acuminate, basally rounded, margin plane or slightly revolute, membranous or subcoriaceous, shiny on both sides, glabrate, veins 6–9 on each side, sometimes puberulent; petioles canaliculate, 7–17 mm long, glabrate; minor leaves wanting. *Inflorescences* axillary or terminal, many-flowered, lax, scandent compound racemes, often dangling, axes 8–15 cm long; peduncles ca. 1 mm long, bracts foliaceous, 1.5 cm long. *Flowers* nocturnal, fragrant, 25–35 mm long, pedicels 1.5–3 mm long, glabrous; bracteoles linear, 0.5–3 mm long; calyx 3.5–5.3 × 2–3.5 mm, costate and rugose, glabrous outside, pilose within, tube 3–3.5 mm long, teeth 0.5–1.8 mm long, erect, ciliate, especially within; corolla yellowish white or pale green, sometimes with purple areas outside, 23–34 mm long, narrowly funnelform, tube narrow, mouth 2–3.5 mm wide, lobes pilose, 6–8 mm long; stamens 17–20 mm long, filaments adnate for 15–19 mm, sparingly pilose 1–3 mm above the base, insertion straight, smooth, free part 0.5–1.2 mm, anthers rotund, 0.5–1 mm across; ovary 1–1.2 × 0.5 mm, glabrous, disk inconspicuous, ovules 8–9, style 16–21 mm long, pilose toward the apex, stigma dilated or subcapitate. *Fruit* color unknown, obovoid, 11–12 × 7.5–8 mm wide; seeds 6–8, brown, 5–5.5 mm long (after Nee 3627). [Francey 6: 268.] Figure 51.

In this species and in *Cestrum reflexum*, the peduncle and pedicels appear as a single continuous stalk, their identities delimited by an articulation and bracteole. In *Cestrum scandens*, the basal, peduncular portion is only about 1 mm long, and the pedicel base continues about 1 mm further, while

in *C. reflexum* the peduncle forms the whole stalk with the bracteole at the top.

Duplicates of *Moritz* 212 at herbaria not noted above are other species. See note pertaining to *Cestrum venezuelense* under *C. bigibbosum* (above).

*Distribution* (Fig. 52). Aragua, Barinas, Carabobo, Falcón, Lara, Miranda, Yaracuy, Zulia, and the Distrito Federal. Gallery forests, and deciduous, semideciduous, and low evergreen forests; 60–1200 m. Also in Mexico, all Central American countries, and Colombia.

*Phenology*. Flowering is from November to April and fruiting from January to April, with maxima in March.

*Common names*. Iguanito Blanco.

*Representative specimens seen*. VENEZUELA. **Aragua**: El Limón, Ferrari 221 (MY). **Barinas**: Isla Mapora, Reserva Forestal de Caparo, Hernández 1189 (MER). **Carabobo**: Canoabo, Trujillo 6147 (MY). **Falcón**: 1 km W of bridge over Río Toeyu at El Alto, Nee & Mori 3961 (US, VEN, WIS). **Lara**: N de Sanare, Ferrari 991 (MY). **Miranda**: Dos Caminos and Los Chorros, Pittier 5925 (P, US, VEN). **Yaracuy**: Quebrada Berracón, 3 km de Albarico, la carretera hacia Aroa, Manara & Vera s.n. (MY-28669). **Zulia**: Vía entre El Pensado y Las Tres Marías, Bunting & Arboleda 8726 (MO, VZU). **Distrito Federal**: El Valle, Arteaga 251 (CAR).

**28. *Cestrum schulzianum*** Francey, Candollea 6: 272. 1935. TYPE: Venezuela. Amazonas: near San Carlos de Río Negro, Spruce 2974 (syn-types, BR not seen, G not seen, = F photo 28372, NY, W not seen).

*Shrub* 1.5–3 m tall, young stems pubescent, branches ridged, leaf scars slightly enlarged; pubescence of simple, moniliform ascending and crumpled hairs. *Leaves* narrowly ovate or narrowly elliptical, sometimes slightly asymmetric, 12–16 × 2.5–4 cm, apically long attenuate, basally acute or slightly cuneate, margin slightly revolute, subcoriaceous, undulate, glabrate, sometimes with fine pubescence on the main veins, veins 6–15 on each side, arising at (60°–)70°(–75°); minor leaves not evident. *Inflorescences* short axillary or terminal racemes, peduncles 3–5 mm long, pubescent with very small ascending hairs; bracts 1–3 mm long, foliaceous, pubescent. *Flowers* nocturnal, fragrant, 28–32 mm long, pedicels 1 mm long or obsolete; calyx tubular, 4–5.5 × 3–3.5 mm, puberulent when young, glabrescent, slightly zygomorphic, costate, the veins salient, tube 3–4 mm long, teeth 1–1.5 mm long, ciliate; corolla pale yellow-green, 27–31 mm long, narrowly funnelform, tube gradually expanded toward the apex, contracted below the limb

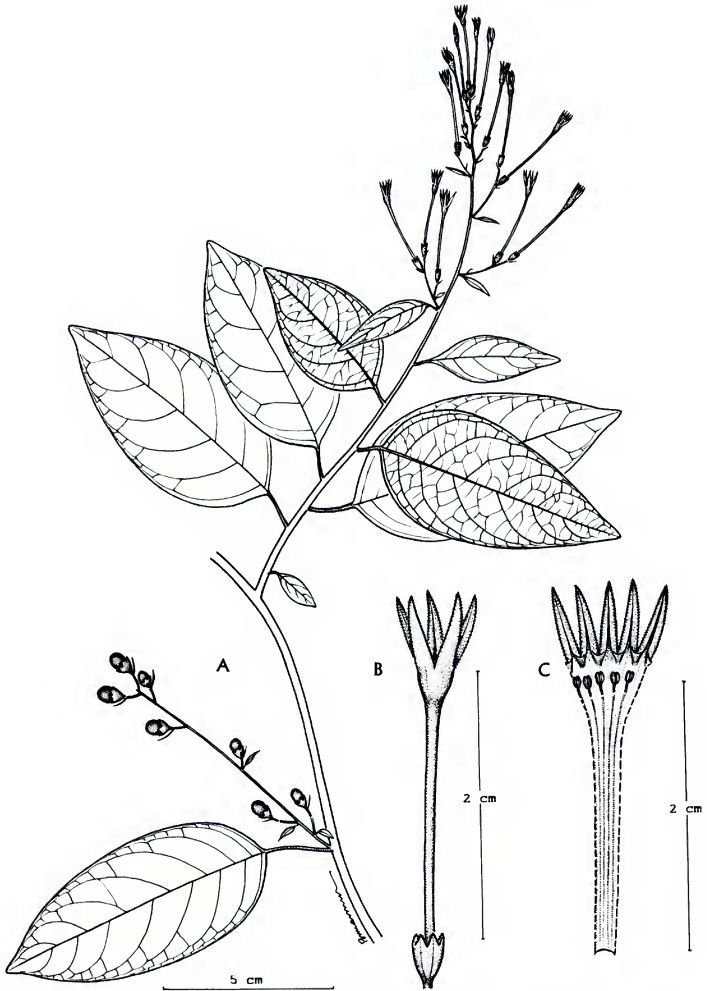


Figure 51. *Cestrum scandens*.—A. Branch with flowers and fruit.—B. Flower.—C. Corolla opened to show stamens. After Trujillo 6147 (MY).

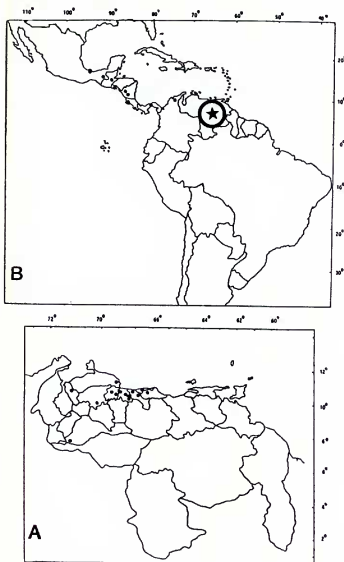


Figure 52. *Cestrum scandens*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

and then expanded, mouth 1–2 mm wide, lobes 5–7.5 mm long, very narrowly ovate, acuminate, pubescent outside; stamens 18.5–21 mm long, filaments adnate for 17–19 mm, base pilose to 13–15 mm up, insertion straight, smooth, free part 0.5–3 mm, anthers globose, 0.5 mm across; ovary 1–1.5 mm across, disk inconspicuous, glabrous, ovules 7–8, style 18–22 mm long, filiform, papillose below the stigma, stigma subcapitate, exserted 0.5 mm. *Fruit* dark purple, subglobose, contracted at the base, 11–12 × 8–9 mm, pericarp thin; seeds 5–7, brown, 5–6 mm long. [Francey 6: 272.] Figure 53.

This species is recognizable by its lanceolate, often narrow, firm leaves with even venation nearly perpendicular to the midvein, and its large corolla lobes. The flowers tend to be aggregated in dense, several-flowered clusters.

*Distribution* (Fig. 35). Amazonas. Evergreen rainforests and “morichales” (successional palm groves occurring on sandy substrates with high wa-

ter table); 100 to 400 m elevation. Apparently endemic.

*Phenology*. Flowering specimens have been seen from April and May. Fruiting data are lacking.

*Common names*. *Cafecillo hoja fina*.

*All additional specimens seen*. VENEZUELA. **Amazonas**: San Carlos de Río Negro, *Liesner 7134* (MO, VEN); Río Casiquiare entre Chapazón y Guirape, W de Solano, *Morillo et al. 4004* (MY, VEN); Río Negro entre la desembocadura del Río Casiquiare y San Carlos de Río Negro, *Morillo et al. 4040* (VEN); Río Negro, entre isla Paleta y El Caño de la División, W y S de Santa Lucía, *Morillo et al. 4105* (MY, VEN); San Carlos de Río Negro, *Stergios & Aymard 7311* (PORT); Río Casiquiare, entre la boca y la piedra Guachapita, *Stergios & Aymard 7358* (MO); Bajo Casiquiare, entre la boca del Pasimoni y Porvenir, *Stergios & Aymard 7606* (PORT).

**29. *Cestrum strigilatum* Ruiz & Pav., Fl. Peruv. 2: 29, pl. 156. 1799. SYNTYPES**: Peru. Pozuzo, Chinchao and Cuchero, *Ruiz & Pavon s.n.* (B not seen, = F photo 18394, HAL).

*Cestrum calycinum* Kunth, in Humb., Bonpl. & Kunth, Nov. Gen. Sp. 3: 58. 1815–1816. *Cestrum strigilatum* var.  $\beta$  *calycinum* (Kunth) Kuntze, Revis. Gen. Pl. 3(2): 220. 189. TYPE: Peru. Near Gonzanama, 1180 hex, *Bonpland s.n.* (holotype, B-W 4461 not seen, = IDC microfiche, = F photo 2998).

*Cestrum viridiflorum* Hook., Bot. Mag. pl. 4022. 1843. TYPE: Brazil. Porto Alegre, *Tweedie s.n.* (holotype, K).

*Cestrum cancellatum* Dunal, in A. DC., Prodr. 13 (1): 657. 1852. TYPE: Peru. *Poeppig 3080* (holotype, G-DC, = IDC microfiche; isotypes, B destroyed, = F photo 2969, F).

*Cestrum unibracteatum* var.  $\beta$  *brachystachys* Dunal, in A. DC., Prodr. 13(1): 657. 1852. TYPE: Brazil. Circa Cujaba ubique, *da Silva Manso 34* (holotype, G-DC, = IDC microfiche, = F photo 23178).

*Cestrum unibracteatum* Dunal, in A. DC., Prodr. 13(1): 656. 1852. SYNTYPES: Peru. Cochero, *Dombey s.n.* (G-DC not seen, = IDC microfiche, = F photo 6899; MPU not seen); *Poeppig 96* (G-DC as “*C. longifolium* Ruiz & Pav. 1246” not seen).

*Cestrum lundianum* Dunal, in A. DC., Prodr. 13 (1): 658. 1852. TYPE: Brazil. Sancti Pauli, *Lund 34* (holotype, G-DC, = IDC microfiche, = F photo 6898).

*Cestrum strigilatum* var. *laxiflorum* Kuntze, Revis. Gen. Pl. 3 (2): 220. 1898. SYNTYPES: Argentina. Oran, *Lorentz & Hieronymus s.n.* (NY); Bolivia. Jungas [Juntas] collector unknown.

*Cestrum impressum* Rusby, Bull. New York Bot. Gard. 4: 425. 1905. TYPE: Bolivia. *Bang 2516* (holotype, NY not seen).

*Sessea rugosa* Rusby, Bull. New York Bot. Gard. 8 (28): 119. 1912. TYPE: Bolivia. Apolo, 4800 ft., *Williams 2449* (NY not seen).

*Cestrum calycinum* var. *tenaiflorum* Francey, Candollea 6: 142. 1935. SYNTYPES: Paraguay. Villa Encarnación, *Bettfreund 131* (place of deposit not indicated); Argentina. Yaguara–Zapa, *Niederlein 268b* (G not seen, = F photo 2998).

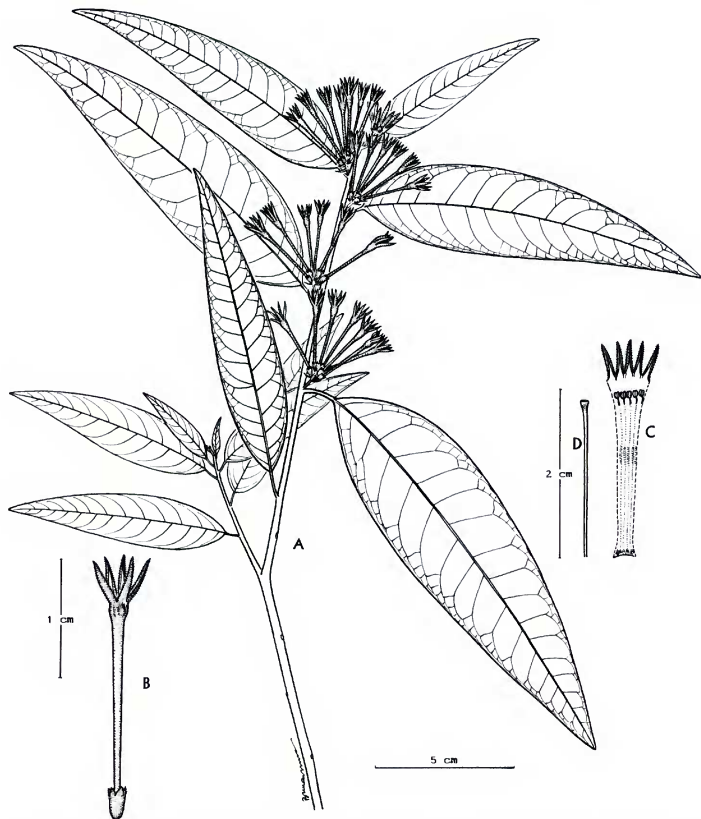


Figure 53. *Cestrum schulzianum*.—A. Flowering branch.—B. Flower.—C. Corolla opened to show stamens.—D. Style and stigma. After Morillo et al. 4004 (VEN).

*Cestrum strigilatum* var. *tenuiflorum* Francy, *Candollea* 6: 144. 1935. TYPE: Ecuador. Balao, Eggers 14274 (lectotype, here designated, W; isolectotype, US fragment).

*Cestrum aristeguietae* Steyerl., *Acta Bot. Venez.* 6: 86. 1971. TYPE: Venezuela. Carabobo: along Río San Gean, 2 km below planta eléctrica, S of Borburata, 350 m, Steyerl. & Steyerl. 95463 (holotype, VEN; isotypes, NY, P, US).

Sprawling or climbing *shrub* or *tree*, 2–4 m tall,

10 cm DBH, much branched, branches elongate, tomentose; pubescence of dendritic and stellate hairs. *Leaves* usually not malodorous, ovate to narrowly ovate, 11–24.5 × 5.5–11 cm, apically attenuate, short-acuminate, base rounded or truncate, margin revolute in firmer leaves, membranous to subcoriaceous, above bright green, gray-green beneath, pubescent, especially on the main veins, lamina glabrescent, sometimes appearing pustular,

tomentose beneath, veins 5–8, prominent on each side, veins sunken above; petiole terete, 0.9–1.5 cm long, tomentose; minor leaves wanting. *Inflorescences* simple axillary or terminal racemes, sometimes short, lateral racemes, peduncles 1.5–4 cm long, pubescence dendritic or stellate, bracts linear, 6–7 mm long, stellate pubescent. *Flowers* diurnal, fragrant?, 30–36 mm long, sessile; calyx firmly tubular, 8–13.5 × 3–3.5 mm, 5-costate, the costas salient, membranous, densely stellate pubescent outside, glabrous within, tube 5–7 mm long, 5-toothed, teeth cuspidate, unequal, 3–6.5 mm long; corolla pale green to white, 29–35 mm long, narrowly funneliform, tube slightly curved, slightly contracted below the ovary, gradually expanded upward, tomentose, especially in the upper half, mouth 2.5–3 mm wide, the lobes narrowly elliptical, 5–8 mm long, apically subacute, folds stellate pubescent; stamens equal, 20–25.8 mm long, filaments glabrous, adnate for 18.5–24.5 mm, insertion straight, smooth, free part 1–1.2 mm, anthers spherical; ovary 1 × 0.8 mm, glabrous, disk inconspicuous, ovules 4–6, style green, 24–25 mm long, hirsute below the stigma, stigma green, capitate. *Fruit* maturing from white to purple, ellipsoidal, 6–10 × 3–5 mm wide; fruiting calyx accrescent, 14–20 mm long, often splitting along one side; seeds 3–7, light brown, 5–5.5 mm long. [Francey 6: 137, 142.] Figure 54; Benítez de Rojas, 1974: 89, figure 22, as *C. aristeguietae*.

*Cestrum strigilatum* is distinct in its uniform pubescence, large, almost spathaceous fruiting calyces, and slender, pubescent corollas.

The unpublished name "*Cestrum longifolium*" was used by Ruiz and Pavón on a specimen of *C. strigilatum* from Peru that was later seen by Dunal (1852: 657). *Cestrum impressum* Rusby was placed in synonymy by Francey (1935: 137). *Sessea rugosa* Rusby was placed in synonymy by Francey (1935: 142).

The chromosome number for this species was reported as  $2n = 16$  by Berg and Greilhuber (1993a).

*Distribution* (Fig. 55). Amazonas, Aragua, Carabobo, and Táchira. Evergreen moist riverine and gallery forests; 300–1600 m. Also in Costa Rica, Panama, Colombia, Ecuador, Peru, Brazil, Bolivia, Paraguay, and northern Argentina.

*Phenology*. Collected in flower from January to April and in fruit in March and April.

*Representative specimens seen*. VENEZUELA. Amazonas: Raudal Montserrat, Alto Orinoco. *Croizat* 666 (NY). Aragua: P. Nacional Henri Pittier, Benítez & Aguilera 4691 (MY). Carabobo: Borburata, *Aristeguieta* 4465

(MO, NY, VEN). Táchira: Palo Grande, Distrito Lobatera, Benítez de Rojas 1269 (GH, MY).

**30. *Cestrum tillettii*** Benítez & D'Arcy, *Novon* 5: 315. 1995. TYPE: Venezuela. Zulia: headwaters of Rfo Guasare, Distrito Perijá, Sierra de Perijá, Serranía de Valledupar, environs of Campamento Frontera V, along international boundary, 2700–3300 m, 10°23'07.8"N, 72°52'42.5"W, *Tillet* 747-1021 (holotype, MY; isotypes, AAU, MO, MYF, VEN).

*Tree* 2–3 m tall; stems brown, glabrous, striate and scarred; pubescence of reduced, simple, glandular hairs. *Leaves* narrowly elliptical, 4–6 × 1–1.7 cm, slightly acute apically, the tip obtuse, basally narrowly cuneate, margin conspicuously revolute, firm, subcoriaceous, dark green, shiny above, dull beneath, glabrous, veins 6–8 on each side, the major veins sunken above, salient beneath, minor veins impressed beneath; petiole canaliculate, 3–7 mm long, glabrous; minor leaves wanting. *Inflorescences* axillary, congested, the main axes tomentose, bright matte green, 1.5–3 cm long, the peduncles 5–7 mm long, pubescent, thickened, with circular scars from fallen flowers, flowers few per node. *Flowers* nocturnal?, 15–19 mm long, sessile (pedicels obsolete) with faint, sweet fragrance during the day; calyx yellow-green, flushed distally with dark purple, tubular, thick, costate, the costas especially conspicuous distally, slightly pubescent outside with hairs slightly thickened near the base, 4.5–5.5 × 2–2.5 mm, 5-toothed, the teeth 1.5–2.5 mm long, narrowly triangular, the apex pubescent; corolla yellow-green and purplish, drying light with darker lobes, clavate, 15–19 mm long, tube 13–16 mm long, slightly expanded toward the apex, the throat not noticeably contracted, mouth ca. 1.5–2 mm wide, lobes 2–2.5 mm long, the folded margins puberulent; stamens 10–13 mm long; filaments white, adnate for 6–9 mm, the insertion geniculate-tumid, slightly pilose, 1 mm long, free part 4.5 mm, anthers brown, spherical, 0.5 mm across; ovary ovoid, glabrous, smooth, 1 mm across, ovules 5, style 12–13.5 mm long, papillose 1–2 mm below the stigma, exceeding the stamens by 1.5 mm, stigma green. *Fruit* shiny blue-black, ovoid, 9 × 6 mm, pericarp thick, opaque; seeds 6–7 per fruit, brown, 3–3.5 mm long. Figure 56.

*Cestrum tillettii* has more or less congested small leaves of uniform appearance on relatively thick, rough branches. The congested flowers are situated among the leaves and close to the stems.

*Distribution* (Fig. 23). Zulia. Slopes on lime-

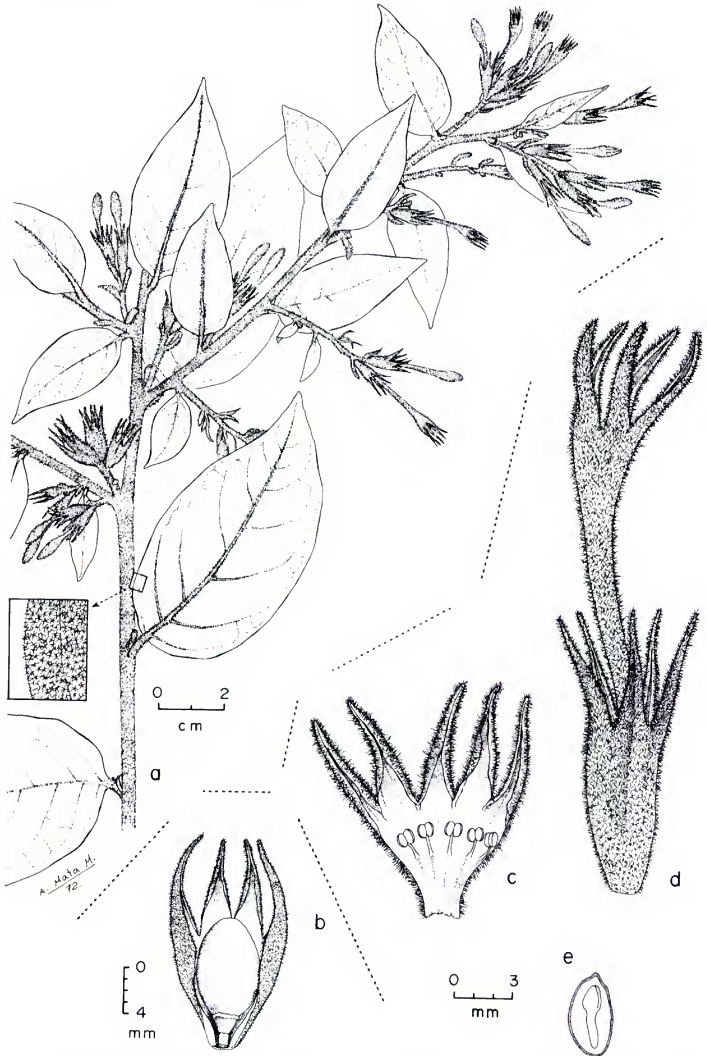


Figure 54. *Cestrum strigilatum*.—a. Flowering branch.—b. Fruit enclosed in persistent calyx.—c. Corolla opened to show stamens.—d. Flower.—e. Seed opened to show embryo. After Benítez 1269 (NY).



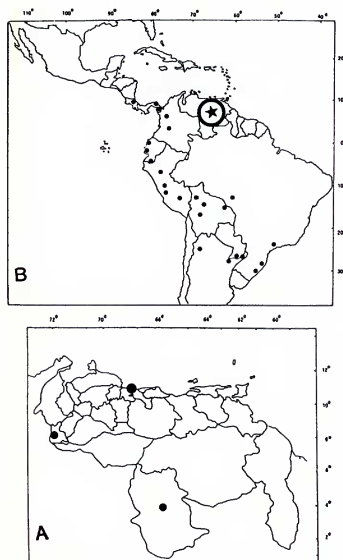


Figure 55. *Cestrum strigilatum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

stone; 2700–3620 m. Restricted to the western border between Venezuela and Colombia.

**Phenology.** Specimens seen were collected in July and were in flower.

All other collections seen. VENEZUELA. **Zulia:** Sierra de Perijá, Tillet & König 747-929 (MY, VEN); headwaters of Río Guasare, Wood & Berry 88 (MO, VEN).

**31. *Cestrum tomentosum* L. f., Suppl. Pl. 150. 1782. SYNTYPES:** Colombia. *Mutis* 94 (LINN. 258.6, = IDC microfiche), 95 (LINN. 258.7, = IDC microfiche).

*Cestrum hirsutum* Jacq., Pl. Hort. Schoenbr. 3: 41, pl. 324. 1798. TYPE: West Indies. Cultivated hortus Schoenbrunensis (holotype, W; isotype, B-W 4449, = IDC microfiche, = F photo 33032).

*Cestrum lanuginosum* Ruiz & Pav., Fl. Peruv. 2: 30, pl. 157. 1799. TYPE: Peru. Arequipa: Camana, collibus arenosis, Ruiz s.n. (lectotype, here designated, G not seen, = F photo 2984; isolectotype, F).

*Cestrum lanatum* M. Martens & Galeotti, Bull. Acad. Roy. Sci. Bruxelles 12: 146. 1845. TYPE: Mexico. Colon-

ie de Mirador, 3000 pieds, Galeotti 1208 (holotype, BR not seen; isotypes, G, K, NY, US, W).

*Cestrum moritzii* Dunal, in A. DC., Prodr. 13(1): 619. 1852. TYPE: Venezuela. Caracas, Moritz 309 (holotype, G-DC, = IDC microfiche, = F photo 2988; isotypes, B destroyed, BM, HBG, MO).

*Cestrum miersianum* Wedd., Chlor. Andina 2: 97. 1859. TYPE: Colombia. Sierra Nevada de Santa Marta, 3300 m, Linden 1615 (holotype, G-DC, = IDC microfiche).

*Cestrum diasae* Pittier, J. Wash. Acad. Sci. 22: 29. 1932. TYPE: Venezuela. Mérida: Misintá, arriba de Mucuchies, 3500 m, Pittier 12919 (holotype, VEN; isotype, US).

*Cestrum meridanum* Pittier, J. Wash. Acad. Sci. 22: 36. 1932. TYPE: Venezuela. Vecinidades de Mérida, 1700 m, Pittier 12858 (holotype, VEN; isotype, US).

*Cestrum miersianum* Pittier, J. Wash. Acad. Sci. 22: 37. 1932, non Wedd. (1857). *Cestrum neomiersianum* Benítez, Revista Fac. Agron. (Maracay) 7: 90. 1974. TYPE: Venezuela. Mérida: San Rafael de Mucuchies, 3150 m, A. Jahn 767 (holotype, VEN; isotypes, MO, ?NY not seen, US).

*Cestrum ambatense* Francey, Candollea 6: 169. 1935. TYPE: Ecuador. Tungurahua: vicinity of Ambato, Pachano 75 (holotype, NY; isotype, US fragment).

*Cestrum densiflorum* Francey, Candollea 6: 195. 1935. TYPE: Venezuela. Mérida: between Chachopo and Timotes, Pittier 13294 (lectotype, designated by Benítez & D'Arcy (1995: 317), NY; isolectotypes, F, MO, US, VEN).

*Cestrum densiflorum* var. *puberulum* Francey, Candollea 6: 196. 1935. TYPE: Venezuela. Trujillo: San Pablo de Mendoza, Pittier 13323 (syntypes, F, MO, US, VEN).

*Cestrum sesseoides* Francey, Candollea 6: 395. 1935. TYPE: Colombia. Santander: eastern cordillera between El Robel and Tona, 1500–1900 m, Killip & Smith 19423 (NY).

*Cestrum verbascifolium* Zucc. ex Francey, Candollea 6: 191. 1935. SYNTYPES: cultivated Berlin and Munich (B not seen, BR not seen).

**Shrub or tree** 1–8 m tall, much branched, stems terete, flexible, tomentose, lenticellate, sometimes subsucculent or sprawling, branches often arching or horizontal, brownish tomentose with a yellowish cream hue; pubescence of mostly sessile, branched and some stellate hairs. **Leaves** malodorous, ovate to elliptical, 4–17 × 2–7.5 cm, apically obtuse, acute or acuminate, basally truncate, rounded or obtuse, narrowly cuneate, margins slightly revolute, sometimes appearing ciliolate, subcoriaceous to membranous, dark green, glabrescent above and then shiny, yellow green, softly tomentose beneath, veins (4–)7–8(–12) on each side, evenly spaced, slightly elevated beneath; petiole canaliculate, 5–12 mm long, tomentose; minor leaves sometimes present, rotund, to 2 cm long, subsessile, sometimes persistent. **Inflorescences** axillary and terminal, mostly among the leaves near the branch ends, many- or few-flowered, congested fascicles, racemes or spikes, much shorter than the leaves, to 6 cm long, sometimes appearing paniculate; bracts



Figure 56. *Cestrum tillettii*.—A. Flowering branch.—B. Flower.—C. Corolla opened to show stamens and style.—D. Fruits. Based on Tillett & König 747-929 (VEN).

ovate or lanceolate, foliaceous, 5–20 × 3–8 mm, pubescent; peduncles mostly short, occasionally to 3 cm long, slightly longer in fruit, tomentose, clusters of 2–6 sessile flowers separated by a 2–6-mm-long rachis. *Flowers* nocturnal; 12–21 mm long,

buds with dark purple lobes; sessile; bracteoles linear, rarely narrowly ovate, to 12 mm long, mostly tomentose, caducous; calyx cupular, campanulate, or tubular, 3–6.5 × 1–3 mm, outside tomentose except sometimes near the base, the veins some-

times inconspicuous beneath the pubescence, glabrescent, inside glabrous, tube 3–5 mm long, teeth narrowly deltoid or obtuse, 0.5–2.5 mm long, narrowly triangular, ciliolate, minutely tufted; corolla greenish, whitish, or yellowish, dark purple outside, often drying dark and with 15 fine nerves evident, yellow-green within, 10–19 mm long, glabrate outside, glabrous within, tube 7–9(–15) mm long, basally slender, expanding gradually or about 2/3 way up, mouth 2.5–4.5 mm wide, lobes greenish white inside, dark brown or dark purple outside, often colored differently from the tube, 1.5–3.5 mm long, acute, ovate, often ciliolate; stamens inserted equally or 1.5 mm apart, 9–15 mm long, filaments adnate for 4.5–11 mm, mostly pubescent, insertion free 1–3 mm, geniculate, tumid, slightly denticulate, glabrous or sparingly pilose, free part (2.5–) 4.5–5 mm; ovary bright green, lobed, 0.5–1 mm across, glabrous, disk 0.5 mm long, ovules 4–8, style 8–15 mm long, bright green 1 mm below the stigma, puberulent, stigma capitate, included. *Fruits* 16–40 per inflorescence, violet, then purple-black, shiny, ovoid, 6–8 × 3–4 mm, juicy; fruiting calyx slightly accrescent, 5–6 mm, basally multinervate, slightly splitting irregularly at the sinuses, often glabrescent; seeds 2–4 per fruit, yellowish brown, 2.5–3.5 mm long. [Francey 6: 171.] Figures 2D, 57.

In Venezuela, *Cestrum tomentosum* is usually amply distinct in its overall pubescence and small, dense flower and fruit clusters. Some collections of *C. humboldtii* from Colombia and eastern Venezuela have similar leaves, but these can be separated by their larger leaves and glabrate calyces. The name *Cestrum verbascifolium* Francey is placed in synonymy based on Francey's (1935–1936) description and key.

Chromosome numbers for this species have been reported as  $2n = 16$  (Sharma & Sharma, 1958, as *C. hirsutum*; Nanda, 1962, as *C. lanatum*).

*Distribution* (Fig. 58). Aragua, Lara, Mérida, Miranda, Monagas, Sucre, Táchira, Trujillo, and the Distrito Federal. Dwarf evergreen forests, ravine banks, dense thickets, roadsides, abandoned coffee plantations; 700 to 2800 m. Also occurring from northwest Sonora, Mexico, through all countries of Central America, and in Colombia, Ecuador, and Peru.

*Phenology*. Flowering occasionally year-round but mostly from January to April. Fruiting is mainly April to May.

*Common names*. *Hedionda*, *Hediondo*, *Quesillo*, *Putá Vieja*, *Trompillo*, *Uvito*.

*Representative specimens seen*. VENEZUELA. **Aragua**: P. Nacional Henri Pittier, between Ocumare de la Costa and El Mirador, Benítez et al. 4876 (MY). **Lara**: Sanare, Montecarlo arriba, Badillo 6763 (MY). **Mérida**: 8 km E of Jaji, D'Arcy et al. 18260 (MO, MY). **Miranda**: El Paraíso, vertiente sur, en antiguos cafetales, 1465 m, Meier 3603 (MY, VEN). **Monagas**: Praderas between Sabana de Las Piedras and las selvas de Cerro Negro, NW of Caripe, Steyermark 61816 (F, MY, VEN). **Sucre**: humid trail to Carapas, Tate 24 (US), 25 (US). **Táchira**: entre Cordero y páramo El Zumbador, Romero 750 (MY). **Trujillo**: La Puerta, entre La Lagunita y la quebrada El Portachuelo, Ruiz-Terán & Dugarte 11999 (MERF, MY). **Distrito Federal**: Antimano, near Caracas, Archer 2991 (US).

**32. *Cestrum tubulosum*** Sendtn., in Mart., Fl. Bras. 10: 207. 1846. SYNTYPES: Brazil. São Paulo: near city of Ytu, da Silva Manso 336 (BR); Campinas, Severin 168 (S not seen).

*Cestrum rojasianum* Hassl., Repert. Spec. Nov. Regni Veg. 9: 120. 1910. TYPE: Paraguay. Río Aquidaban, Rojas 10033 (holotype, G not seen, = F photo 28371).

*Shrub* or small *tree* to 2 m tall, branches terete, pubescent, especially toward the tips, internodes 10–15 mm long; pubescence of small, simple or sparingly branched, stout yellowish or reddish, ascending, usually dense, curved, sometimes gland-tipped hairs. *Leaves* ovate or elliptical, strongly upfolded from the costa, 5–9 × 3–4.8 cm, attenuate upward from the middle, basally obtuse, rounded, slightly cordate, margins revolute, subcoriaceous, rigid, matte dark green above, lighter beneath, glabrous above, beneath with few ascending, gland-tipped hairs, veins 5–9 on each side, elevated beneath, minor (5th order) venation forming well-developed areoles, less visible beneath; petioles 2–6 mm long, margined above by leaf base; minor leaves wanting. *Inflorescences* few-flowered in the leaf axils; axes stout, short, densely pubescent with long, branched hairs. *Flowers* diurnal, strongly fragrant, 25–32 mm long, sessile, bracteoles linear to narrowly ovate and foliaceous, 3–5 mm long, pubescent; bracts ascending, resembling the leaves, caducous; calyx cupular, 3.5–6 × 2 mm, costate, glabrous outside, tube 3–4 mm long, 2.5 mm, teeth 0.5–2 mm long, slightly unequal, sutures rounded, ciliate, apically mucronate; corolla light green, 24–31 mm long, tubular, tube cylindrical and expanded upward, slightly contracted below the limb, mouth 3.5–5 mm wide, lobes narrowly ovate, apically tufted, sinuses basally ciliate, 4–6 mm long; stamens equal, 19.5–21.5 mm long, filaments adnate for 15–20 mm, basally pilose, insertion straight, smooth, free part 1.5–2 mm, anthers spherical, 0.5 mm across; ovary globose, 1.2 mm across, glabrous, disk conspicuous, ovules 9–11,

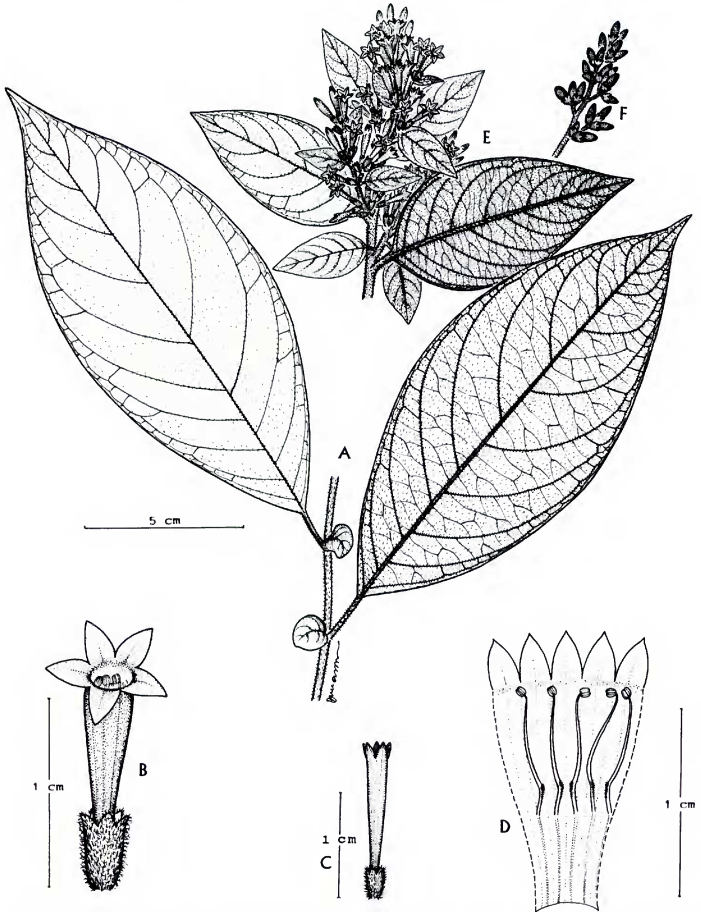


Figure 57. *Cestrum tomentosum*.—A. Vegetative branch showing minor leaves.—B. Flower.—C. Flower beginning to open.—D. Corolla opened to show stamens.—E. Flowering branch.—F. Fruits. A, B, D, E, F after Morillo 3017 (VEN). C after Benítez 4667 (MY).

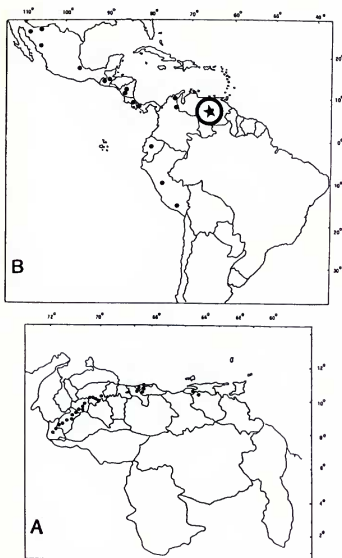


Figure 58. *Cestrum tomentosum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

style filiform, 16–20 mm long, papillose below the stigma, stigma peltate, inconspicuously 4-lobed. *Fruit* green?, ovoid, 8–11 × 5–6 mm, pericarp thin; seeds 3–4, olive brown, 6–7.5 mm long. [Francey 6: 208.] Figure 59.

Hairs on *Cestrum tubulosum* are much like those of *C. neblinense*, but denser, and the leaves are broader, mostly more than 2 cm wide.

Our use of this name is based on a photo of the type of *Cestrum rojasianum* and Francey's (1935–1936) placement of *C. rojasianum* in synonymy under *C. tubulosum*.

**Distribution** (Fig. 60). Amazonas and Bolívar. Gallery forests; 100 to 300 m, and riverine woods associated with tepui vegetation; 1100 to 1400 m. Also in Paraguay and Brazil.

**Phenology.** The collections seen were flowering in January and March and fruiting in March.

*All remaining specimens seen.* VENEZUELA. **Amazonas:** Dept. Atures, Río Corocoro, W of Serranía de Yu-

tajé, *Holst & Liesner 3173A* (MO); Dept. Atabapo, Marahuaca, *Liesner 18464* (MO); Serranía Yutajé, Río Manapiare, Camp Yutajé, *Maguire & Maguire 35094* (MO, NY, US). **Bolívar:** Distrito Cedeño, Serranía de Guanay, Río Parguaza, *Huber 11033* (MY, MYF).

*Sessea* Ruiz & Pav., Fl. Peruv. Prodr. 21. 1794.  
TYPE: *Sessea stipulata* Ruiz & Pav.

Unarmed trees; pubescence of simple or branched hairs. Leaves simple, entire, pinnately nerved, mostly glabrate above; mostly short petiole; minor leaves present or not. Inflorescences axillary and pseudoterminal, few- or many-flowered racemes, spikes, or cymes, often large and appearing panicle-like; bracts often present. Flowers mostly 5-merous, pedicellate, bracteolate; calyx small, cupular or tubular, mostly shallowly lobed; corolla narrowly tubular, much exceeding the calyx, lobed, the lobes narrow, shorter than the tube, spreading or reflexed when open; stamens inserted in the corolla tube at similar levels, the insertion levels varying greatly in different species, the adnate portion mostly evident from the corolla base, the insertion variously pubescent or tumid, anthers small, situated together at the corolla mouth; ovary mostly shorter than the calyx, 2-locular, ovules 4–16, style slender, style capitate or variously lobed, small, in at least some species oblique on the style apex. Fruit a narrowly ellipsoid or ovoid, terminally dehiscent capsule; seeds varying in number, ovoid, surrounded by a hyaline wing; embryo straight.

The name *Sessea* Endlicher (1838: 668) is an orthographic variant of *Sessea* Ruiz & Pav.

**1. *Sessea corymbiflora*** Goudot ex Rich. Taylor & R. Phillips, Philos. Mag. Ann. Chem. 3: 132. 1828. TYPE: near Bogotá, *Goudot 1* (lectotype, designated by Benítez & D'Arcy (1993: 324), P; isolectotypes, K, G-DC not seen, = IDC microfiche, G).

*Sessea corymbosa* Miers, Hooker's J. Bot. Kew Gard. Misc. 5: 156. 1846. TYPE: Bogotá ad Barro Blanco, *Goudot 1* (holotype, K not seen; isotypes, G-DC not seen, = IDC microfiche, P, G).

*Cestrum atrovirens* Dunal, in A. DC., Prodr. 13(1): 648. 1852. *Sessea atrovirens* (Dunal) B. D. Jacks., Index. Kew. 2: 892. 1895. TYPE: Ecuador [Peru], Quito, *Hartweg 1309* (holotype, G = F photo 8573; isotypes, B not seen, K not seen, P).

*Shrubs or trees* to 6 m tall; unarmed, pubescence of reduced moniliform simple hairs to 0.5 mm long, glabrous on most parts; twigs angled from the petiole bases and often striate-furrowed. *Leaves* 11–15 per twig, not odorous, perennial, elliptical, occasionally ovate or obovate, mostly 9–13(–20) × 3–

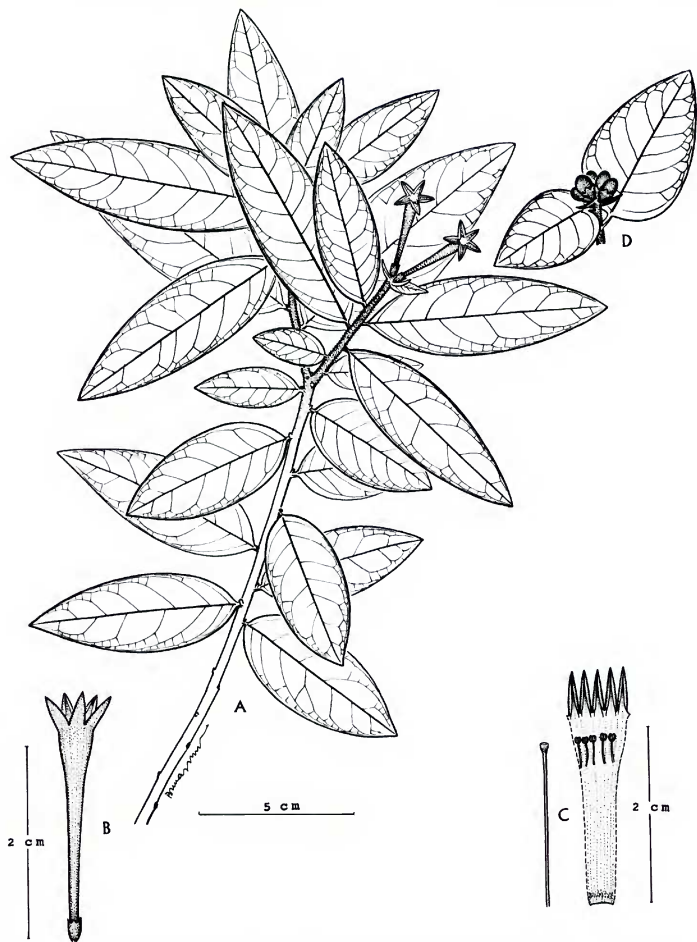


Figure 59. *Cestrum tubulosum*.—A. Flowering branch.—B. Flower.—C. Corolla opened to show stamens and style.—D. Fruiting branch. After Huber 3245 (VEN).

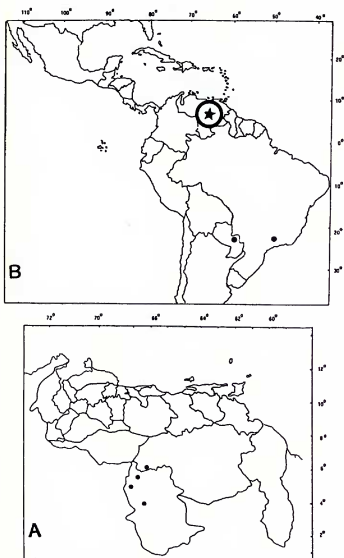


Figure 60. *Cestrum tubulosum*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

5(–6) cm, apically obtuse or acute, sometimes slightly short-acuminate, basally obtuse, margins sometimes slightly revolute, coriaceous or firmly membranous, costa drying dark above, elevated and excurrent beneath, glabrous or with occasional reduced trichomes near the base, major veins 17–20, mostly evenly spaced 3–6 mm apart, arcuate at 30°–40° to the costa, plane above, finely reticulate beneath, drying reddish or slate gray; minor leaves mostly wanting, when present oblong, to 6 cm long and resembling the major leaves; petioles mostly slender, 5–25 mm long, slightly scurfy with reduced trichomes, drying darker than the leaf, especially at the base. *Inflorescences* lax, crowded, terminal corymbs to 6 cm long; peduncles and pedicels drying dark, pedicels wanting, bracts few, scattered among the inflorescence and resembling reduced leaves; pedicels obsolete; bracteoles 1.5 mm long, narrowly ovate or linear, glabrate with sparse, reduced, glandular-appearing trichomes, soon caducous. *Flowers* numerous (ca. 83), crowded, malodorous, 20–22 mm long, sessile; calyx dark green,

tubular-obconical, 5–6 × 4 mm, glabrous outside, the costas sometimes conspicuous, the teeth sinuate-deltoid 0.5 mm long, minutely ciliate, but not tufted apically, pubescent within; corolla green with purple areas, 14–21 mm long, exerted 9–13 mm from the calyx, tube 13–21 mm long, basally slender, 1 mm wide, expanding about ½ way up to 4–5 mm wide, glabrous outside, the fine nerves inconspicuous, glabrous within, mouth 2.5–3.5 mm wide, lobes 1–3 mm long, obtuse or rounded, glabrous outside; stamen insertion levels subequal, filaments adnate for 6–7 mm, 6 mm free, the free insertion 1.5–2 mm, distal free portion 5 mm long, insertion tumid, a few minute hairs present just below the insertion, distal portion glabrous; style 12–13 mm, glabrous, stigma unequally bilobate, the two lobes forming a mouth flanking the stigmatic surface; ovary glabrous, disk inconspicuous, ovules 6–8. *Fruit* a woody, apically dehiscent capsule, 6–7 mm long, the valves 4, linear, 2.5 mm wide at the base; fruiting calyx slightly accrescent, 6–7 mm, enclosing the base of the capsule, splitting irregularly; seeds 5–12, appearing flat and 14–15 mm long overall, the seed body ellipsoidal, 3–4 × 1 mm, chestnut-brown, surrounded by a light green, membranous, minutely reticulate, oblong wing extending 3–4 mm beyond each end of the seed and 0.25 mm on each side, the ends pointed or rounded, sometimes with one or more narrow wings in another plane; embryo white, 2.5–3 mm long, the hypocotyl straight, terete, the epicotyl laminar, broadly elliptical, forming ¼ the length of the embryo. Figure 61.

In the absence of fruit, *Sessea corymbiflora* is similar to *Cestrum lindeni*, with its large leaves with many veins and in the general appearance of its flowers. However, the flowers of *S. corymbiflora* are shorter, and the stigma is placed obliquely on the style. The spent capsules are persistent for several months, and from a distance the trees resemble arborescent Asteraceae.

*Distribution* (Fig. 62). Mérida, Táchira, and Trujillo. Subparamos; 2200–2900 m. Also in Colombia and Ecuador.

*Phenology*. Flowering collections have been seen from February, July, and September.

*All specimens seen*. VENEZUELA. **Mérida**: Páramo Las Nieves, 48 km al sur de Estanquez, Benítez et al. 4839 (CAR, MA, MO, MY, P, VEN). **Táchira**: P. Nacional Los Páramos, carretera Pregonero–El Portachuelo, Benítez et al. 4741 (F, MER, MERF, MO, MY, NY, PORT, US, VEN). **Trujillo**: entre El Alto de Tuñame y Quebrada El Pajarito, Ruíz-Terán & López-Palacios 7552 (MERF, MY).

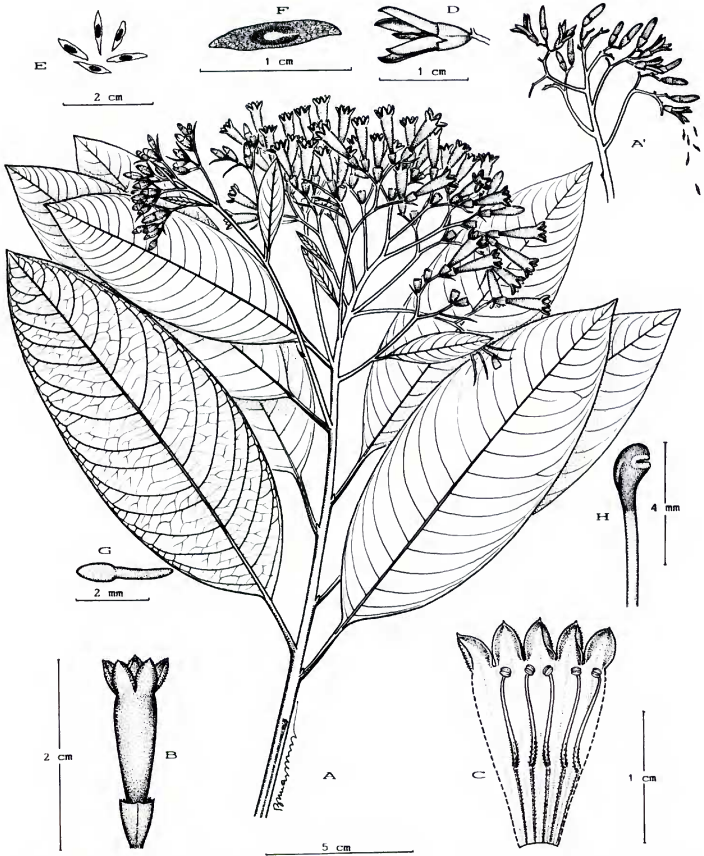


Figure 61. *Sessea corymbiflora*.—A. Flowering branch.—A'. Infructescence.—B. Flower.—C. Corolla opened to show stamens.—D. Fruiting capsule.—E. Seeds.—F. Seed showing body and wing.—G. Embryo.—H. Style. A—H after Ruiz-Terán 7552 (MERF). A' after Benítez 4741 (MY).

#### Literature Cited

- Andrade, S. O. 1960. Estudos sobre a toxicidade de *Sessea brasiliensis*. Arq. Inst. Biol. (S. Paulo) 27: 191–196.  
 Atkinson, G. C. & T. K. James. 1979. Preliminary study on the control of Red Cestrum. Pp. 289–291 in Pro-

- ceedings of the 32nd New Zealand Weed & Pest Control Conference, New Zealand Weed and Pest Control Society, Palmerston North, New Zealand.  
 Benítez de Rojas, C. E. 1974. Los géneros de las Solanaceae de Venezuela. Revista Fac. Agron. (Maracay) 7(3): 25–103.  
 ——— & W. G. D'Arcy. 1993. Nomenclature of *Sessea*



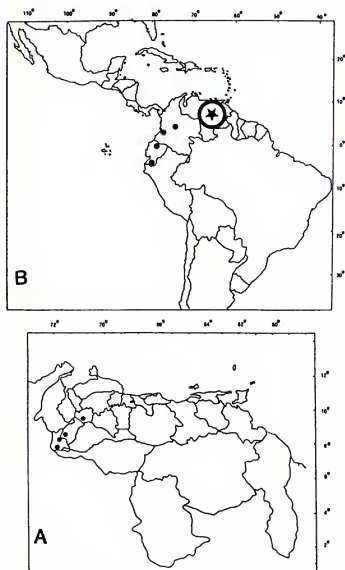


Figure 62. *Sessea corymbiflora*.—A. Distribution in Venezuela.—B. Representative occurrences outside of Venezuela.

*corymbiflora* (Solanaceae) and its occurrence in Venezuela. *Novon* 3: 324–327.

— & —. 1995. New species of *Cestrum* (Solanaceae) and synonymy under two widespread species. *Novon* 5: 311–317.

— & —. 1998. *Cestreae* in Venezuela. In M. Nee, D. Symon, J. Jessup & J. G. Hawkes (editors), *Solanaceae IV: Advances in Biology and Utilization*. Royal Botanic Gardens, Kew (in press).

Bernardello, L. M., L. Galetto, J. Jaramillo & E. Grijalba. 1994. Floral nectar chemical composition of some species from Reserva Río Guajalito, Ecuador. *Biotropica* 26: 113–116.

Berg, C. & J. Greilhuber. 1992. Cold-sensitive chromosome regions and their relation to constitutive heterochromatin in *Cestrum parqui* (Solanaceae). *Genome* 35: 921–930.

— & —. 1993a. Cold-sensitive chromosome regions and heterochromatin in *Cestrum* (Solanaceae): *C. strigilatum*, *C. fasciculatum*, and *C. elegans*. *Pl. Syst. Evol.* 185: 133–151.

— & —. 1993b. Cold-sensitive chromosome regions and heterochromatin in *Cestrum aurantiacum* (Solanaceae). *Pl. Syst. Evol.* 185: 259–273.

Bitter, G. 1922. Zur Gattung *Sessea*. *Repert. Spec. Nov. Regni Veg.* 18: 199–215.

Danert, S. 1958. Die Verzweigung der Solanaceen im reproductiven Bereich. *Abh. Deutsch. Akad. Wiss. Berlin, Kl. Chem.* 6: 1–292.

D'Arcy, W. G. 1970. Jacquin names, some notes on their typification. *Taxon* 19: 554–560.

—. 1974. *Solanaceae*. In R. E. Woodson et al., *Flora of Panama*. *Ann. Missouri Bot. Gard.* 60: 573–870.

—. 1979. The classification of the Solanaceae. Pp. 3–48 in J. G. Hawkes, R. N. Lester & A. D. Skelding (editors), *The Biology and Taxonomy of the Solanaceae*. Academic Press, London.

—. 1997. Red-flowered cestrums and red-loving hummingbirds. In M. Nee, D. Symon, J. Jessup & J. G. Hawkes (editors), *Solanaceae IV: Advances in Biology and Utilization*. The Royal Botanic Gardens, Kew (in press).

Darlington, C. D. & A. P. Wylie. 1955. *Chromosome Atlas of Flowering Plants*, 2nd ed. Allen & Unwin, London.

Dunal, F. 1852. *Solanaceae*. In A. De Candolle, *Prodromus systematis naturalis regni vegetabilis* 13(1): 1–741. Paris, France.

Dyer, A. F. 1963. Allocyclic segments of chromosomes and the structural heterozygosity that they reveal. *Chromosoma* 13: 547–576.

Eichler, A. 1875. *Blütendiagramme Construiert und Erläutert*. W. Engelmann, Leipzig.

Endlicher, S. L. 1838. *Genera Plantarum* 668.

Fleming, T. H. 1988. *The Short-tailed Fruit Bat: A Study in Plant-Animal Interactions*. Univ. Chicago Press, Chicago.

Fournet, J. 1978. *Flore Illustrée des Phanérogames de Guadeloupe et de Martinique*. Inst. Nat. Recherche Agronomique, Paris.

Francey, P. 1934. Übersicht über die Gattung *Sessea*. *Notizbl. Bot. Gart. Berlin-Dahlem* 11: 978–990.

—. 1935–1936. *Monographie du genre Cestrum L. Candollea* 6: 46–398; 7: 1932.

Freeman, C., W. H. Reid, J. E. Becvar & R. Scogin. 1984. Similarity and apparent convergence in the nectar-sugar composition of some hummingbird-pollinated flowers. *Bot. Gaz.* 145: 132–135.

Gill, L. S. 1972. Chromosome numbers in West-Himalayan bicarpellate species II. *Bull. Torrey Bot. Club* 99: 36–38.

Gottsherger, G., J. Schrauwen & H. F. Linskens. 1984. Amino acids and sugars in nectar, and their putative evolutionary significance. *Pl. Syst. Evol.* 145: 55–77.

Haber, W. A. & G. W. Frankie. 1989. A tropical hawk-moth community: Costa Rican dry forest Sphingidae. *Biotropica* 21: 156–172.

Jacquin, N. J. 1798. *Volume 3. Plantarum rariorum horti caesarei schoenbrunnensis*. Vienna.

Krook, L., R. H. Wasserman, J. N. Shively, A. H. Tashjian, T. D. Brokken & J. F. Morton. 1975. Hypercalcemia and calcinosis in Florida horses: Implication of the shrub, *Cestrum diurnum*, as the causative agent. *Cornell Veterin.* 65: 26.

Madhavadian, P. 1968. Chromosome numbers in South Indian Solanaceae. *Caryologia* 21: 343–347.

McLennan, M. W. & W. R. Kelly. 1984. *Cestrum parqui* (green cestrum) poisoning in cattle. *Austral. Veterin. J.* 61: 289–291.

Mehra, P. N. & K. S. Bawa. 1969. Chromosomal evolution in tropical hardwoods. *Evolution* 23: 466–481.

Nanda, P. C. 1962. Chromosome numbers of some trees and shrubs. *J. Indian Bot. Soc.* 41: 271–277.

- Nee, M. 1986. Solanaceae I. In Flora de Veracruz. Fasc. 49: 1-191. Inst. Nac. Inv. Recurs. Biot., Xalapa.
- Olmstead, R. G. & J. D. Palmer. 1992. A chloroplast DNA phylogeny of the Solanaceae: Subfamilial relationships and character evolution. *Ann. Missouri Bot. Gard.* 79: 346-360.
- , J. A. Sweere, R. E. Spangler, L. Bohs & J. D. Palmer. 1997. Phylogeny and provisional classification of the Solanaceae based on chloroplast DNA. In M. Nee, D. Symon, J. Jessup & J. G. Hawkes (editors), *Solanaceae IV: Advances in Biology and Utilization*. The Royal Botanic Gardens, Kew (in press).
- Overland, L. 1960. Endogenous rhythm in opening and odor of flowers of *Cestrum nocturnum*. *Amer. J. Bot.* 47: 378-382.
- Percival, M. 1965. *Floral Biology*. Pergamon Press, Oxford.
- Pittier, H. 1932. Studies in Solanaceae. I. The species of *Cestrum* collected in Venezuela up to 1930. *J. Wash. Acad. Sci.* 22: 25-37.
- Prema, T. P. & N. Raghuramulu. 1994. Free vitamin D<sub>3</sub> metabolites in *Cestrum diurnum* leaves. *Phytochemistry* 37: 677-681.
- Procter, M., P. Yeo & A. Lack. 1996. *The Natural History of Pollination*. Timber Press, Portland, Oregon.
- Romeike, A. 1978. Tropane alkaloids—Occurrence and systematic importance in angiosperms. *Bot. Not.* 131: 85-96.
- Ruiz Zapata, T. 1993. La morfología del polen de *Gleome* L. en relación con su taxonomía y síndromes de polinización. *Pittieria* 21, ed. especial 297. [Abstract.]
- Sachs, R. M. 1985. *Cestrum*. Pp. 176-184 in A. H. Halvey (editor), *CRC Handbook of Flowering*, Vol. 2. CRC Press, Boca Raton, Florida.
- Sharma, A. K. & A. Sharma. 1958. Karyotype studies in *Cestrum* as an aid to taxonomy. *Genetica* 29: 83-100.
- Ule, E. 1908. Die Pflanzenformationen des Amazonas-Gebietes II. Pflanzengeographische Ergebnisse meiner in den Jahren 1900-1903 in Brasilien und Peru unternommenen Reisen. *Bot. Jahrb. Syst.* 40: 398-443.
- Wasserman, R. H. 1974. Calcium absorption and calcium-binding protein synthesis: *Solanum malacoxylon* reverses strontium inhibition. *Science* 183: 1092-1194.
- . 1978. The nature and mechanism of action of the calcinogenic principle of *Solanum malacoxylon* and *Cestrum diurnum*, and a comment on *Trisetum flavescens*. Pp. 545-553 in R. F. Keeler, K. R. van Kampen & L. F. James, *Effects of Poisonous Plants on Livestock*. Academic Press, New York.
- White, R. H., R. D. Stevenson, R. R. Bennett, D. E. Cutler & W. A. Haber. 1994. Wavelength discrimination and the role of ultraviolet vision in the feeding behavior of hawkmoths. *Biotropica* 26: 427-435.
12. *Cestrum latifolium* Lam.
13. *Cestrum lindeni* Dunal
14. *Cestrum mariquitense* Kunth
15. *Cestrum megalophyllum* Dunal
16. *Cestrum microcalyx* Francey
17. *Cestrum neblinense* D'Arcy & Benítez
18. *Cestrum nocturnum* L.
19. *Cestrum olivaceum* Francey
20. *Cestrum pariense* Steyererm.
21. *Cestrum petiolare* Kunth
22. *Cestrum potatifolium* Dunal
23. *Cestrum racemosum* Ruiz & Pav.
24. *Cestrum reflexum* Sendtn.
25. *Cestrum ruizerianum* Benítez & D'Arcy
26. *Cestrum salicifolium* Jacq.
27. *Cestrum scandens* Vahl
28. *Cestrum schulzianum* Francey
29. *Cestrum strigatum* Ruiz & Pav.
30. *Cestrum tillitii* Benítez & D'Arcy
31. *Cestrum tomentosum* L. f.
32. *Cestrum tubulosum* Sendtn.
33. *Sessea corymbiflora* Taylor & Phillips

## INDEX TO ENSICCATAE

Specimens are listed alphabetically by collector, followed by collector number and herbarium of deposit; the species is indicated by a number in parentheses corresponding to the number in the List of Species above.

- Agostini (MY-56467) (16); 76 (VEN) (2). Agostini & de Agostini 1171 (MY, VEN) (12). Agostini & Fariñas 90 (MY, US, VEN) (4). Agostini et al. 1187 (VEN) (31). Aguiar 8 (VEN) (7). Allart 254 (NY, US, VEN) (26); 475 (US, VEN) (2); 480 (VEN) (21). Alston 6619 (MO, US) (5); 7098 (BM, US) (29); 7099 (US) (31). Archer 2986 (US) (27); 2987 (US) (27); 3090 (US) (12). Aristeguieta 792 (VEN) (13); 1667 (VEN) (15); 2291 (VEN) (4); 2514 (VEN) (5); 2525 (F, MER, VEN) (21); 2765 (VEN) (26); 2769 (US, VEN) (23); 2869 (US, VEN) (15); 3689 (VEN) (21); 3691 (MO, US, VEN) (31); 3703 (F, MO, US, VEN) (26); 4009 (MO, VEN) (15); 4179 (VEN) (12); 4465 (MO, VEN) (29); 5041 (VEN) (12); 5434 (VEN) (26); 5463 (MO, VEN) (27); 5962 (VEN) (31); 6164 (VEN) (12); 6649 (VEN) (7); 747 (VEN) (31); 748 (VEN) (21); 7757 (VEN) (31); 7812 (VEN) (31); 12460 (VZU) (2). Aristeguieta & Foldats 1504b (VEN) (4). Aristeguieta & Huber 302 (VEN) (31). Aristeguieta & Medina 3651 (VEN) (5). Aristeguieta et al. 7260 (F, MER, MY, US, VEN) (12). Arroyo 75-105 (VEN) (4); 75-123 (VEN) (15). Arroyo & Aristeguieta 75-100 (VEN) (15). Artega 107 (CAR) (31); 251 (CAR) (27). Ayala 697 (MER, MY) (12). Aymard 2 (MER) (7); 524 (MY, PORT) (12); 1020 (VEN) (12); 1951 (MY, PORT) (12); 4496 (MY) (12); 5536 (MO, MY, PORT, VEN) (12). Aymard & Cuello 3567 (MY, PORT) (12); 5591 (MY, MO, PORT) (12). Aymard & Ortega 1343 (MY) (5); 2541 (MY, PORT) (12). Aymard et al. 2222 (MER, MY) (14); 1922 (MY, PORT) (31); 2747 (MY, PORT) (12); 3741 (MY, PORT) (4).
- Badillo 1726 (MY) (31); 218 (VEN) (31); 5255 (MY) (21); 6629 (MY) (4); 6693 (MY) (4); 6763 (MY) (31); 6818 (MY) (5); 6836 (MY) (5); 6909 (MY) (21); 691 (VEN) (21); 6942 (MY) (21); 7058 (MY) (21); 7078 (MY) (13); 7085 (MY) (21); 720 (VEN) (2); 8004 (MY) (21). Badillo & Badillo 6782 (MY) (5); 7297 (MY) (31). Badillo et al. 7848 (MY) (14). Barclay & Juagibioy 9754 (MO) (5). Barcos (MY-67838) (15). Barrios 14 (MY) (18). Bascopé 34 (MY) (31). Belandria 191 (MER) (14); 204 (MER) (14); 9

## LIST OF SPECIES

1. *Cestrum acuminatissimum* Dunal
2. *Cestrum alternifolium* (Jacq.) O. E. Schulz
3. *Cestrum aurantiacum* Lindl.
4. *Cestrum bigibbosum* Pittier
5. *Cestrum buxifolium* Kunth
6. *Cestrum cuneifolium* Francey
7. *Cestrum diurnum* L.
8. *Cestrum glabrescens* (C. V. Morton) Steyererm. & Maguire
9. *Cestrum humboldtii* Francey
10. *Cestrum imbricatum* Rusby
11. *Cestrum jaramillanum* Benítez & D'Arcy

- (MER) (14). Benítez 87 (MY) (18); 91 (MY) (12); 95 (MY) (12); 550 (MY) (12); 563 (MY) (12); 1033 (MY) (18); 1034 (MY) (18); 1211 (MY) (27); 1212 (MY) (12); 1213 (MY) (12); 1218 (MY) (12); 1269 (MY) (29); 1294 (MY) (31); 1303 (MY) (21); 1307 (MY) (12); 1309 (MY) (12); 1438 (MY) (21); 1448 (MY) (16); 1556 (MY) (7); 1564 (MY) (16); 1609 (MY) (2); 1809 (MY) (2); 1825 (MY) (4); 1895 (MY) (13); 1937 (MY) (12); 1944 (MY) (2); 1960 (MY) (12); 1979 (MY) (31); 2034 (MY) (21); 2111 (MY) (23); 2130 (MO, MY, NY) (29); 2144 (MY) (31); 2164 (MY) (12); 2168 (MY) (23); 2169 (MY) (12); 2606 (MY) (2); 2750 (MY) (4); 2828 (MY) (12); 2883 (MY) (12); 2913 (MY) (12); 2929 (MY) (12); 3093 (MY) (16); 3140 (MY) (16); 3212 (MY) (4); 3560 (MY) (26); 3577 (MY) (15); 3616 (MY) (15); 3783 (MY) (9); 3850 (MY) (26); 3857 (MY) (26); 3902 (MY) (12); 3920 (MY) (12); 3955 (MY) (21); 3994 (MY) (16); 4159 (MY) (15); 4230 (MY) (15); 4239 (MY) (12); 4281 (MY) (2); 4287 (MY) (4); 4522 (MY) (21); 4551 (MY) (26); 4668 (MY) (31); 4674 (MY) (5); 4675 (MY) (5); 4681 (MY) (2); 4692 (MY) (15); 4739 (MY) (21); 4740 (MY) (13); 4746 (MY) (21); 4756 (MY) (12); 4782 (MY) (31); 4784 (MY) (31); 4795 (MY) (31); 4799 (MY) (5); 4802 (MY) (21); 4803 (MY) (5); 4811 (MY) (4); 4828 (MY) (31); 4844 (MY) (31); 4846 (MY) (13); 4849 (MY) (31); 4851 (MY) (5); 4854 (MY) (13); 4860 (MY) (21); 4864 (MY) (23); 4870 (MY) (9); 4876 (MY) (31); 4877 (MY) (23); 4885 (MY) (15); 4895 (MY) (12); 4896 (MY) (12); 4897 (MY) (14); 4900 (MY) (23); 4901 (MY) (14); 4907 (MY) (26); 4909 (MY) (4); 4912 (MO, MY) (22); 4913 (MY) (4); 4915 (MY) (15); 4916 (MY) (2); 4997 (MY) (26); 4998 (MY) (4); 4999 (MY) (22); 5036 (MY) (14); 5037 (MY) (12); 5040 (MY) (14); 5046 (MY) (15); 5049 (MY) (14); 5051 (MY) (21); 5056 (MY) (13). Benítez & Aguilera 4691 (MY) (29). Benítez & Baldizán 4945 (MY) (23). Benítez & Gimenez 4157 (MY) (15). Benítez & Otero 4604 (MY) (13); 4716 (MY) (31). Benítez & Rojas 3083 (MY) (12); 4719 (MY) (23); 4996 (MY) (23). Benítez et al. 3576 (MY) (4); 4110 (MY) (4); 4223 (MY) (15); 4667 (MY) (31); 4814 (MY) (5); 4741 (F, MER, MERF, MO, MY, NY, PORT, US, VEN) (33); (CAR, MA, MO, MY, P, VEN) (33). Bernardi 313 (P) (13); 484 (MER, NY) (2); 2045 (MER) (4); 2079 (VEN) (5); 3329 (MER, MY) (12); 6097 (MER) (31); 6183 (MER) (21); 6235 (MER) (4); 7127 (MER, VEN) (24); 7439 (MER) (23); 7626 (VEN) (15); 7760 (VEN) (5). Bernardi et al. 13056 (NY) (6); 17200 (G, MO, NY) (6). Berry 3492 (MY) (2); 3663 (MO) (2); 379 (VEN) (2); 439 (VEN) (12); 4807 (MO, MYF) (12); 49 (MO, VEN) (2); 501 (VEN) (2). Bevilacqua 163 (VEN) (2); 414 (VEN) (2). Birschel s.n. (GH) (18). Blanco 24 (VEN) (31). Bond et al. 101 (US) (12). Bono 4022 (MY) (4); 5043 (MY) (18); 5082 (MY) (4); 5891 (MY, VEN) (13); 5956 (CAR, MY) (13). Boon & Grillo 6559 (MO, MYF, NY) (12). Breteler 3352 (MER, P, U, US, VEN) (5); 3384 (VEN) (21); 3568 (MER, P, VEN) (31); 3614 (MER, MO, US, VEN) (31); 3721 (MER, US, VEN) (14); 3732 (F, MER, US, VEN) (12); 3898 (F, MO, US, VEN) (12); 4029 (F, MER, MO, P, US, VEN) (12); 4072 (MER) (4); 4305 (MER, MO, US, VEN) (2); 4652 (F, MO, VEN) (5). Briceño 40 (VEN) (18). Briceño & Adamo 717 (MY) (5). Broadway 316 (US) (12); 707 (US) (12). Bruijn 1183 (MER, MO, US, VEN) (23). Bunting 5598 (MO, VZU) (12); 7747 (MO) (12); 8042 (MO, VEN, VZU) (12); 9418 (MO, VZU) (12). Bunting & Alfonso 13278 (MY, VZU) (12); 7294 (MO, VEN) (12). Bunting & Arboleda 8726 (MO, VZU) (27); 8759 (VZU) (12). Bunting & Fucci 6049 (MO, VZU) (15); 7577 (MO, VEN) (12). Bunting & Stoddard 8907 (MO, VZU) (12); 9055 (VZU) (27). Bunting et al. 11120 (MY, VEN) (15). Bunting et al. 12023 (MO) (12). Bunting et al. 12481 (MO, MY, VZU) (12). Bunting et al. 12800 (MY) (15). Bunting et al. 7345 (MO, VZU) (12). Burandt V0049 (MY, UCOB) (4). Burandt & Garófolo V0596 (MY) (5). Burkart Arturo 16396 (VEN) (27). Calvo 0003 (MY) (23). Camero (MY-85034) (27). Cárdenas de Guevara. L. 1707 (MY) (2). Cardona 31 (US, VEN) (12). Cardozo 1137 (MY) (4); 1225 (MY) (4); 1364 (MY) (4); 1515 (MY) (22); 1709 (MY) (4). Carnevali et al. 535 (VEN) (27). Caro 3 (MY) (12). Casadiego & Campos 378 (MY) (14). Castillo 1961 (MY) (16); 1962 (VEN) (15); 478 (VEN) (12). Castroviejo et al. 411 (MA) (12). Cawz 12 (MY) (7). Chaffanjon s.n. (P) (12). Chardon 33 (VEN) (12); 271 (US, VEN) (4). Chardon et al. 3204 (VIA) (12); 3222 (VIA) (29). Charpin & Jacquemoud (HAC-13440 G, MO) (21). Charpin et al. 13146 (MO, NY) (16). Clark 6948 (MO, NY) (1). Colella & Morales 563 (MY) (15). Colma et al. 103 (CORO, MY, VEN) (2); 244 (CORO, MY, VEN) (2); 247 (VEN) (2); 248 (CORO, MY, VEN) (2); 351 (CORO, MY) (2). Croat 21406 (MO, VEN) (15); 54467 (MO, VEN) (15); 54936 (MO) (21); 60795 (MO, VEN) (4). Croizat 392A (F) (12). Cumana 1274 (IRBR, MY) (12); 1574 (IRBR, MY) (12). Curran & Haman 988 (MO, US) (23). D'Arcy & Benítez 18236 (MO) (5); 18258 (MO) (13); 18261 (MO) (21). Davids & González 15984 (MO, VEN) (1); 16721 (MO) (15); 19999 (MO, VEN) (12); 21967 (MO, VEN) (1). De Martino et al. SPB 1120 (MYF) (12). Delascio 4087 (CAR, VEN) (4); 4118 (CAR) (4); 7579 (VEN) (15); 7673 (CAR) (12); 9724 (VEN) (4). Delascio & Benkowski 3145 (CAR) (12); 3125 (CAR) (12). Delascio & Delascio 5042 (CAR, VEN) (5). Delascio & López 2555 (CAR, VEN) (12). Delascio & Velasco 692 (CAR) (22); 693 (CAR) (22). Delascio et al. 13401 (VEN) (12); 15026 (VEN) (12); 5006 (CAR, VEN) (5). Delgado 236 (VEN) (21). Diaz 526 (MO) (4). Diederichs 172 (VEN) (4); 303 (VEN) (4). Dorr & Barnett 5163 (VEN) (5). Dorr et al. 4858 (VEN) (23); 7900 (MY, NY, PORT) (13). Edwards & Roe 28 (MY) (4). Edwards et al. 99 (MY) (22); 107 (K, MY) (4); 360 (K, MER, MERF, MO, MY, NY, PORT, US, VEN) (29); 467 (K, MY) (29). Elias 239 (CAR) (7). Ernst s.n. (HBC) (3). Ewell 195 (MY) (23). Fendler 9 (MY) (27); 547 (MY) (31); 746 (MY) (21); 2090 (MO) (26); 2091 (GH) (29); 935 (GH, MO) (31); 954 (MO, P) (13); 955 (GH, MO, NY) (4); 956 (MO) (21); 958 (GH) (27); 959 (GH, MO, NY) (2); 961 (GH) (23); 962 (GH, NY) (22); 963 (GH) (31); 966 (GH, MO, NY) (12). Fernández 1266 (MY) (12); 2480 (MY) (4); 2671 (MY) (12); 3151 (MY) (20); 3888 (MY) (12); 4017 (MY) (12); 4018 (MY) (12). Fernández et al. 10 (MER) (2); 200 (CAR, MY, PORT) (2); 5239 (MY, PORT) (12); 84 (MER) (2). Ferrari 141 (MY) (27); 142 (MY) (27); 221 (MY) (27); 272 (MY) (12); 991 (MY) (27). Ferrari & Bunting 1672 (MY) (31). Field 282a (K, MY) (15); 313 (K, MY) (15); 441 (K, MY) (15); 497 (MY) (16). Figuera (MY-68080) (27). Funck & Schlim 429 (BM, P) (31); 627 (G) (31); 784 (G, P) (13). García 142 (VEN) (22); 153 (VEN) (4); 172 (VEN) (31). Gebriger 255 (F, P, VEN) (31); 299 (F, MO, VEN) (21); 40 (F, MO, VEN) (5). Gentry 41165 (MO) (15). Gentry et al. 10439 (MO, VEN) (12). Gines & Rudd 1599 (CAR) (31). Gentry & Stein 47262 (MO, MY, VEN) (15). Gines 1763 (CAR, US) (5); 2003 (MY) (12); 4665 (US) (31). González 160 (MER) (2); 3 (VEN) (2). González & Ortega 1310 (MO, MY, VEN) (15). Gragson & Gragson 48 (MY) (1). Groussard 13 (P) (2). Guánchez & Mercado 1921

- (TFAV) (12). Guevara (MY-68083) (12). Gutiérrez 225 (TFAV) (12).
- Hernandez 1189 (MER) (27). Holst 3733 (MO) (8). Holst & Liesner 2724 (VEN) (15). Holst et al. 2024 (VEN) (12). Holt 19 (VEN) (2). Horner 419 (MO, MYF) (12). Horner et al. 404 (MO, MYF) (12). Hoyos 2091 (CAR) (7). Hoyos & Delascio 4285 (CAR, VEN) (15); 4292 (CAR, VEN) (2). Hoyos & Foldats 3091 (CAR) (2). Huber 207 (VEN) (4); 6250 (MY, MYF) (23); 11033 (MY, MYF) (2). Huber & Roth 1732 (VEN) (15). Humbert 26521 (P) (2). Hurtado (MY-68082) (27).
- Ijjasz 305 (MY, VEN) (21).
- Jahn 767 (MO, US, VEN) (31); 811 (US, VEN) (5); 923 (US, VEN) (5); 1075 (US, VEN) (13). Jeffrey & Trujillo 2457 (MY) (5). Jimenez Saa 1320 (MER) (12). Johnston 385 (GH) (2).
- Killip 37251 (F, GH, US, VEN) (12).
- Laskowski & Ramirez 70 (VEN) (12). Lasser 70 (VEN) (2); 1091 (VEN) (13); 1114 (US, VEN) (22); 189 (US, VEN) (2); 2037 (VEN) (22); 2279 (VEN) (26); 2281 (VEN) (2); 2334 (VEN) (15); 2339 (VEN) (23); 3469 (VEN) (18); 3533 (MY, VEN) (7); (VIA-3275) (26). Lasser & Aristeguieta 3376 (F, VEN) (2). Lasser & Foldats 3150 (VEN) (2). Lasser & Vareschi 6052 (VEN). Lasser et al. 2904 (VEN) (23). Liesner 3611 (MO, MY, VEN) (1); 5373 (MO, VEN) (2); 6877 (VEN) (1); 7083 (MO, VEN) (1); 7134 (MO, VEN) (23); 7557 (VEN) (1); 8210 (MO, VEN) (15); 10024 (MO, VEN) (15); 11803 (MO) (15); 13384 (MO) (2); 16661 (MO, MY, VEN) (17); 16999 (VEN, MY) (15); 17789 (MO) (8); 18484 (MO) (8). Liesner & González 5822 (MO, VEN) (12); 9311 (MO, VEN) (1); 9322 (MO, VEN) (1); 9478 (MO, VEN) (15); 9844 (VEN) (4); 9930 (MO, VEN) (15); 10179 (MO, VEN) (4); 10412 (MO, VEN) (1); 10471 (MO, VEN) (14); 11265 (MO, VEN) (12); 13238 (MO, MY, VEN, VZU) (15). Liesner & Gnariiglia 11658 (MO, VEN) (4). Liesner & Medina 13524 (MY, VEN) (26); 13559 (MO, MY) (21); 13578 (MY, VEN) (4). Liesner & Steyermark 12330 (MA, MO, VEN) (12); 12347 (MO, VEN) (4). Liesner et al. 12617 (MY, VEN) (14); 12836 (MO, VEN) (15); 7755 (MO, VEN) (4). Lütke 15360 (MER, VEN) (23); 15522 (VEN) (13); 15745 (VEN) (13). Løjnant & Molau 15835 (AAU, GB) (11). López & Sandoval 495 (CAR, MY, VEN) (12). López-Figueiras 8754 (MERF, MY) (21). López-Palacios 86 (MER, MO) (7); 340 (MER, MO) (2); 1255 (MERF, MY) (12); 1373 (MERF) (5); 1505 (MO) (31); 1507 (MO) (31); 1886 (MO, VEN) (15); 1988 (MERF, MO, MY, VEN) (12); 2145 (MERF, MY) (2); 2150 (MER, MO, VEN) (23); 2637 (MO) (21); 2732 (MERF) (4). López-Palacios & Bautista 3193 (MER) (12). Lozada (MY-67062) (23). Luteyn 5250 (F, MO, NY, US, VEN) (5); 6191 (NY) (25). Luteyn & Lebrón-Luteyn 6240 (MO, VEN) (21); 9834 (MO) (21). Luteyn et al. 5370 (F, MO, VEN) (13); 6076 (F, VEN) (5); 6171 (MY, NY, VEN) (25); 6196 (F, MO, VEN) (21); 8208 (MY, NY, VEN) (15); 9802 (MO) (5). Madrid 50 (MY) (23).
- Maguire & Maguire 35219 (NY) (1). Maguire et al. 42500 (MO, US) (17). Manara 113381 (MO) (15); s.n. (F-1805024) (2); s.n. (MO-2671613) (31); s.n. (MY-65436) (26); s.n. (VEN-113158) (31); s.n. (VEN-113165) (2); s.n. (VEN-115002) (21); s.n. (VEN-1805023) (21); s.n. (VEN-115003) (2); s.n. (VEN-172746) (2); s.n. (VEN-174788) (29); s.n. (VEN-174796) (15); s.n. (VEN-175090) (15); s.n. (VEN-176654) (22). Manara & Vera (MY-28669) (27). Marceno-Berti 1519 (MER) (12). Marceno-Berti & Torres-Lezama 207 (MER, VEN) (23). Marceno-Berti et al. 457-979 (MER, MY) (23). Matos 120 (CAR) (12); 1122 (CAR, VEN) (13). Medina 520 (VEN) (4); 531 (VEN) (22); 533 (VEN) (15). Meier & Silva 1565 (MY, VEN) (21); 61 (MY, VEN) (31); 768 (MY) (13); 901 (MY, VEN) (13); 1205 (MY, VEN) (22); 1312 (MY, VEN) (13); 1329 (MY, VEN) (13); 1723 (MY, VEN) (13); 1816 (MY, VEN) (13); 1909 (MY, VEN) (31); 3174 (MY, VEN) (13); 3180 (MY, VEN) (13); 3284 (MY, VEN) (4); 3330 (MY, VEN) (21); 3603 (MY, VEN) (31). Meier & Silva 1565 (MY, VEN) (21). Meier et al. 2642 (MY, VEN) (15). Mocqueris 1092 (MY, P, US, VEN) (31). Montes 61 (VEN) (12). Morales 215 (MY) (31); 249 (MY) (21). Moreno 23 (MY) (27). Mori et al. 14667 (VEN) (4). Morillo 1777 (MY, VEN) (2); 8346 (MY, VEN) (2); 11105 (MERF) (5). Morillo & García 11385 (MY) (6); 11475 (MERF, MY) (9); 11478 (MERF, MY) (19). Morillo & Hasegawa 5026 (MY, VEN) (1). Morillo & Liesner 9130 (MO, VEN) (12). Morillo & Manara 2135 (MER, MO, MY, VEN) (23); 667 (MY) (31). Morillo & Medina 8730 (VEN) (4). Morillo & Morillo 2966 (VEN) (15); 7112 (MY, VEN) (12). Morillo & Ramirez 8135 (MY, VEN) (12). Morillo & Seres 8627 (VEN) (26). Morillo & Smith 5856 (MY, VEN) (4); 6018 (MY, VEN) (31). Morillo et al. 9572 (VEN) (12); 4004 (MY, VEN) (28); 4040 (VEN) (28); 4105 (MY, VEN) (28); 4257 (F, MO, US) (12); 7149 (VEN) (12); 8452 (VEN) (27). Moritz 212 (B, HBG, G-DC) (27); 212b (BM) (4); 309 (BM, G-DC, MO) (31); 348 (W) (4); 824 (BM, G-DC) (22); 1641 (BM) (26); 1931 (P) (12). Moritz s.n. (BM) (21).
- Nee 17450 (F, VEN) (12); 17563 (F, VEN, WIS) (2); 30689 (MY, VEN) (8); 31259 (MY, VEN) (18). Nee & Mori 3961 (US, VEN) (27); 4107 (US) (14). Nee & Whalen 17147 (F, VEN) (18).
- Oberwinkler 13446 (MER, VEN) (13). Ortega 1671 (MO, MY, PORT) (14); 549 (MY) (12); 631 (MY, PORT) (12). Ortiz 1196 (MY, VEN) (15); 1261 (MY, VEN) (15). Ortiz et al. 1145 (VEN) (12); 1157 (VEN) (12). Osorio (MY-84794) (27). Otto 704 (G, P) (27).
- Páez et al. 29 (MY) (14). Pietrangeli (MY-86956), (MY-86957), (MY-86958) (31); (MY-86959) (5); 1226 (MY, VEN) (4); 1243 (MY, VEN) (13); 1269 (MY) (31); 2020 (MY) (13); 2147 (MY) (13); 2149 (MY) (31); 2337 (MY) (13). Pipoly et al. 6478 (MO) (5). Pittier 166 (VEN) (13); 5797 (F, NY, US, VEN) (12); 5925 (P, US, VEN) (27); 9200 (GH, NY, US, VEN) (27); 9245 (US, VEN) (4); 10045 (US, VEN) (21); 10393 (GH, US, VEN) (23); 11215 (VEN) (7); 12094 (NY, US, VEN) (12); 12332 (G, NY, US, VEN) (12); 12639 (GH, NY, VEN) (31); 12858 (US, VEN) (31); 12911 (US, VEN) (5); 12919 (US, VEN) (31); 13029 (G, NY, US, VEN) (18); 13210 (F, MO, US, VEN) (5); 13294 (F, MO, US, VEN) (31); 13323 (F, MO, US, VEN) (31); 13963 (US, VEN) (27); 14075 (VEN); Pittier & Nakichenovitch 15368 (VEN) (4); 15683 (VEN) (4). Plozman 7765 (F, MO) (13). Ponce & Trujillo 634 (MY) (5). France 28160 (MO) (15). Pulgar (MY-16420) (27). Pursell et al. 8432 (VEN) (12).
- Quintero 70 (MER, MY) (7); 134 (MER, MY) (23); 161 (MER) (12); 526 (MER) (23); 1310 (MER) (31); 2039 (MER) (13); 2292 (MER) (13). Quintero & Carroz 1082 (MER) (13). Quintero & Ricardi 1524 (MER) (14). Quintero et al. 235 (MER) (2).
- Ramía & Ortiz 8626 (VEN) (12). Ramirez 2148 (MY) (12); 234 (MY, VEN) (12). Ramirez & López 3162 (MY) (2). Reggiov & de Scorza (VEN-118911) (18). Ricardi & Adamo 576 (MY) (31). Ricardi & Carroz 9 (MER) (12). Ricardi & Salcedo 5734 (MER) (13); 5744 (MER) (23); 5756 (MER) (23). Rivero 1678 (MO) (5). Rivero et al. 1888 (MO, MY, PORT) (14). Rodríguez I (MER) (4); 71 (MY) (12); 118 (MY) (12); 203 (MY) (12). Rodríguez & Cardozo 1729 (MY) (4). Rodríguez et al. 1357 (MY) (4).

- Romero 357 (MY) (12); 750 (MY) (31); 1035 (MY) (31). Ruiz 4183 (MY) (4); 4297 (MY) (4). Ruiz et al. 429 (VEN) (2); 525 (VEN) (2); 532 (VEN) (2); 579 (VEN) (2); 1507 (VEN) (2); 1644 (VEN) (2); 2101 (VEN) (2); 4501 (MY) (12); 4718 (MY) (14); 4719 (MY) (14). Ruiz-Terán 1761 (MER. MO) (12); 1774 (MER) (12); 2205 (MY) (33); 2878 (MER. MERF) (12); 2978 (MER) (4); 3019 (MERF) (13); 3195 (MER. MY) (21); 3548 (MER. MY) (12); 3579 (MER) (2); 3606 (MER) (7); 6312 (MERF) (21); 6819 (MY) (5); 6867 (MER. MY) (21); 6911 (MERF) (5); 12094 (MERF. MY) (21); 13420 (MY) (5); 13426 (MY) (5); 13430 (MERF. MY) (21); 13516 (MY) (5). Ruiz-Terán & Dugarte 12219 (MY) (5); 14886 (MY) (13); 14539 (MERF. MY) (31); 11999 (MERF. MY) (31); 12935 (MY) (13); 15916 (MERF. MY) (21); 15985 (MERF. MY) (21). Ruiz-Terán & Gallardo 12641 (MERF. MY) (2). Ruiz-Terán & López-Figueiras 279 (MERF. MY) (5); 358 (MY) (5); 731 (MY) (5); 1024 (MY) (5); 1756 (MY) (5); 1998 (MERF) (5); 8306 (MY) (5); 8791 (MERF) (13); 8898 (MY) (5); 949 (MY) (5); 13086 (MY) (5). Ruiz-Terán & López-Palacios 1651b (MY) (5); 7550 (MERF. MY) (21); 7552 (MY) (33); 7615 (MERF) (13); 9925 (MY) (12); 9975 (MY) (18); 10223 (MERF. MY) (2). Ruiz-Terán & Marcano-Berti 1241 (MER) (23); 1325 (MER. MY) (12); 1390 (MY) (5); 1494 (MY) (5). Ruiz-Terán & Ruiz-Pérez 14956 (MERF. MY) (31); 15673 (MY) (13). Ruiz-Terán et al. 3818 (MERF. MY) (31); 3841 (MY) (5); 3859 (MY) (5); 3914 (MERF) (31); 3948 (MERF) (21); 3989 (MERF) (13); 6113 (MERF. MY) (7); 6214 (MY) (2); 6743 (MER. MERF) (13); 8226 (MERF. MY) (5); 10651 (MY) (12); 12357 (MERF. MY) (21); 14230 (MERF. MY) (21); 14266 (MERF. MY) (31); 14677 (MERF. MY) (31); 15135 (MERF. MY) (21); 16114 (MY) (5); 16146 (MERF. MY) (21); 16154 (MY) (25); 16171 (MY) (25); 16303 (MERF. MY) (31). Rusby & Squires 327 (F. G. GH. MO. US) (12). Rutkis 373 (MY. VEN) (12).
- Saer 15 (US. VEN) (2); 17 (G. NY) (2); 162 (US. VEN) (27); 184 (MY. US. VEN) (2); 445 (F. VEN) (31); 833 (NY. US. VEN) (12). Schnee 1260 (MY) (12). Schott 123 (F) (7). Schulz et al. 330 (VEN) (5). Smith 3507 (F. US) (13); V1555 (VEN) (31); V165 (VEN) (15); V41 (VEN) (2); V5242 (VEN) (4); V585 (VEN) (2); V7153 (VEN) (23); V7661 (VEN) (7); V8487 (VEN) (31). Spruce 2974 (BR. G. NY) (28). Stergios 821 (MY) (5); 1528 (MY) (31). Stergios & Aymard 7311 (PORT) (28); 7358 (MO) (28); 7606 (PORT) (28); 7770 (MO. MY) (1). Stergios 5630 (MY. PORT) (12). Stergios & Delgado 12910 (MY. PORT) (12). Stergios & Utrera 2465 (MY. PORT) (15). Stergios et al. 3977 (MY. PORT) (12); 5347 (MO. PORT) (12); 6626 (MO. MY. PORT) (15); 8573 (MY. PORT) (12); Steyermark 55008 (MY. VEN) (26); 55689 (MY. VEN) (13); 55695 (F. VEN) (21); 55713 (F. MY. VEN) (5); 55972 (MY. VEN) (31); 56219 (F. VEN) (2); 56322 (F. MY. VEN) (14); 56453 (MY. VEN) (4); 56518 (F. MY. VEN) (5); 57006 (MY. VEN) (22); 57031 (MY. VEN) (13); 57102 (VEN) (13); 59314 (F. MY. VEN) (12); 60925 (F. VEN) (12); 61711 (MY. VEN) (23); 61816 (F. MY. VEN) (31); 61844 (F. VEN) (4); 61974 (MY. VEN) (4); 62371 (F. MY. VEN) (12); 62434 (MY. VEN) (7); 62525 (F. VEN) (2); 75663 (F. VEN) (8); 75682 (F. VEN) (8); 86286 (NY. VEN) (4); 86845 (VEN) (12); 87218 (MO. VEN) (12); 88525 (US. VEN) (2); 88871 (F. US. VEN) (12); 89833 (NY. US. VEN) (4); 90560 (US. VEN) (12); 90566 (US. VEN) (12); 91594 (VEN) (13); 91611 (VEN) (13); 91659 (VEN) (26); 91672 (F. VEN) (13); 92106 (F. US. VEN) (26); 92147 (P. US. VEN) (11); 93274 (F. US. VEN) (8); 95075 (VEN) (20); 95083 (F. P. VEN) (15); 99040 (VEN) (4); 99361 (VEN) (4); 99368 (VEN) (4); 99894 (MO. US. VEN) (23); 101047 (US. VEN) (6); 104947 (VEN) (31); 105035 (P. VEN) (21); 105056 (P. VEN) (5); 106207 (US. VEN) (4); 107001 (VEN) (12); 107414 (MO. US. VEN) (12); 111264 (US. VEN) (8); 120447 (VEN) (12); 122681 (VZU) (12); 125620 (VEN) (26); 127851 (MO) (13); 129677 (MO. MY. VEN) (8). Steyermark & Agostini 91026 (US. VEN) (20). Steyermark & Braun 94598 (P. VEN) (2). Steyermark & Bunting 102318 (VEN) (12). Steyermark & Carreño E. 108771 (VEN) (23); 111662 (F. US. VEN) (12). Steyermark & Liesner 118501 (VEN) (19); 118531 (VEN) (4); 118748 (MO. VEN) (4). Steyermark & Manara 110407 (MO. VEN) (2); 125448 (MY. VEN) (5). Steyermark & Nevling 95906 (VEN) (4). Steyermark & Perkins 122032 (MY. VEN) (15). Steyermark & Rabe 96236 (VEN) (15). Steyermark & Steyermark 95366 (US. VEN) (15); 95463 (NY. P. US. VEN) (29). Steyermark & Wessels-Boer 100397 (MO. VEN) (15); 98775 (MY. VEN. US) (5); 100219 (MO. US. VEN) (4); 100602 (F. US. VEN) (21); 100827 (F. MY. US. VEN) (9); 101047 (MO. VEN. US) (10); 101530 (MO. US. VEN) (1); 108403 (P. VEN) (4); 111522 (VEN) (15); 114590 (MO. VEN) (12); 119545 (MO. VEN) (1); 119881 (VEN) (4); 121278 (VEN) (12); 121518 (MO) (15); 121595 (MO. VEN) (20); 121863 (MO. VEN) (31); 122650 (MO. MY. VZU) (12); 123025 (MO. VEN. VZU) (2); 123352 (MO. VEN) (15); 124269 (MY. VEN) (12); 124739 (MY. VEN) (15); 124887 (MY. VEN) (12); 127229 (MO. MY) (12); 131034 (CAR. MO) (15). Sugden 1192 (MO) (15).
- Tamayo 116 (VEN) (13); 2077 (US. VEN) (12); 2500 (VEN) (2); 2933 (US. VEN) (12); 319 (VEN) (2); 4367 (MY) (5). Tamayo et al. 2504 (VEN) (13). Tate 24 (US) (31); 25 (US) (31); 885 (US) (8). Tengler 3967 (CAR) (18). Tejera 133 (US) (2). Thomas et al. 3392 (MY) (15). Tillett 737-307 (MY) (21); 746-454 (MY) (18); 747-1021 (AAU. MO. MY. MYF. VEN) (30). Tillett & König 737-276 (MY) (21); 738-460 (MY) (21); 738-534 (MY) (21); 747-929 (MY) (30). Tillett & Sayago 843-35 (MY. MYF) (18). Tillett et al. 761-35 (MYF. MY) (15); Torres et al. 19 (MY) (5); 371 (MY) (4). Trujillo 1306 (MY) (13); 1930 (MY) (15); 1962 (MY) (4); 2784 (MY) (31); 3993 (MY) (13); 4629 (MY) (12); 4756 (MY) (2); 4816 (MY) (12); 5121 (MY) (31); 6147 (MY) (7); 6317 (MY) (15); 6549 (MY) (2); 6837 (MY) (2); 7473 (MY) (2); 7635 (MY) (4); 8382 (MY) (21); 9124 (MY) (4); 979 (MY) (31); 14541 (MY) (12). Trujillo & Fernández 30 (MY) (23); 856 (MY) (21); 16351 (MY) (12). Trujillo & Ponce 18282 (MY) (13); 19702 (MY) (18). Trujillo & Rodriguez 17987 (MY) (12).
- Valverde & Peña 1061 (MER. MY) (12); 1069 (MER) (14); 1070 (MER. VEN) (14). van der Werff & Ortiz 5859 (MO. VEN) (4). van der Werff & Wingfield 3107 (MY) (2). van der Werff et al. 51 (WIS) (2); 74 (WIS) (2); 576 (CORO. MY) (4); 3209 (WIS) (15); 8771 (MO) (13). Vareschi 5635 (VEN) (5); 7549 (VEN) (5). Vareschi & Lasser 374 (VEN) (5); 6052 (VEN) (5). Vogel 1238 (US) (12); A237 (BM) (26); 406 (BM. M. S. US. VEN) (27).
- Weitzman & Boom 95 (MYF) (16). Wessels Boer 2210 (VEN) (5). Wessels Boer et al. 2421 (MER. VEN) (21). Williams 9937 (F. VEN) (13); 9948 (F. US. VEN) (13); 11476 (F. GH. US. VEN) (12); 11544 (F. US. VEN) (12); 11670 (VEN) (12); 13652 (F) (27). Wingfield 5116 (CORO. MY) (7); 5214 (MO. WIS) (2); 6818 (WIS) (2). Wingfield & López-Figueiras 7640 (CORO. MY) (4). Wood 322 (VEN) (22); 412 (VEN) (15); 429 (VEN) (22). Wood & Berry 88 (VEN) (30). Woronov 7079 (F) (13). Wurdack & Steyermark 1083 (VEN) (8); 1366 (VEN) (8).
- Xena 583 (MO. MY) (31); 1053 (MY) (15).

Jeffrey 2457 (MY) (5).  
Zambrano & Alfonso 1340 (HERZU, VEN) (12); 1404 (HERZU, VEN) (12). Zambrano & Gutierrez 1529 (HERZU, VEN) (15); 1790 (HERZU) (15). Zambrano et al. 1899 (HERZU) (12); 2217 (HERZU) (23).

## INDEX TO SCIENTIFIC NAMES

<i>Alkekengi</i> Feuillée . . . . .	277	<i>laetum</i> Francey . . . . .	287
<i>Cestreae</i> G. Don . . . . .	277	<i>lanatum</i> M. Martens & Galeotti . . . . .	337
Cestrineae . . . . .	277	<i>lanuginosum</i> Ruiz & Pav. . . . .	337
<i>Cestrum</i> L. . . . .	277	<i>latifolium</i> Lam. . . . .	277, 294, 300
<i>acuminatissimum</i> Dunal . . . . .	280	<i>latifolium</i> var. <i>genuinum</i> Stehlé . . . . .	302
<i>albopunctatum</i> Dunal . . . . .	300	<i>latifolium</i> var. <i>tenuiflorum</i> (Kunth) O. E. Schulz . . . . .	300
<i>alternifolium</i> (Jacq.) O. E. Schulz . . . . .	281	<i>laurifolium</i> Fawc. . . . .	292
<i>alternifolium</i> var. <i>mithanthum</i> O. E. Schulz . . . . .	281	<i>laurifolium</i> L'Herit. . . . .	292, 318
<i>alternifolium</i> var. <i>pendulinum</i> (Jacq.) O. E. Schulz . . . . .	281	<i>luxiflorum</i> Dunal . . . . .	287, 329
<i>ambatanse</i> Francey . . . . .	337	<i>lindenii</i> Dunal . . . . .	302, 325
<i>amelanchier</i> Dunal . . . . .	281	<i>longifolium</i> Ruiz & Pavón . . . . .	277, 318, 334, 335
<i>amplum</i> Pittier . . . . .	304	<i>lorentense</i> Francey . . . . .	280
<i>aristeguietae</i> Steyerf. . . . .	334	<i>lundianum</i> Dunal . . . . .	334
<i>atrovirens</i> Dunal . . . . .	341	<i>mariquitense</i> Kunth . . . . .	283, 304
<i>aurantiacum</i> Lindl. . . . .	285	<i>mariquitense</i> var. <i>latifolium</i> (Francey) Standl. & C. V. Morton . . . . .	304
<i>aurantiacum</i> var. <i>chaculanum</i> (Loes.) Francey . . . . .	285	<i>mathewsii</i> Dunal . . . . .	320
<i>baenitzii</i> Lingelsh. . . . .	306	<i>megalophyllum</i> Dunal . . . . .	281, 306, 320
<i>bigibbosum</i> Pittier . . . . .	287	<i>melanochloranthum</i> Dunal . . . . .	289
<i>billbergianum</i> Beurl. . . . .	300	<i>meridanum</i> Pittier . . . . .	337
<i>bogotense</i> Roem. & Schult. . . . .	304	<i>microcalyx</i> Francey . . . . .	308
<i>bogotense</i> var. <i>latifolium</i> Francey . . . . .	304	<i>miersianum</i> Pittier . . . . .	337
<i>buxifolium</i> Kunth . . . . .	289	<i>miersianum</i> Wedd. . . . .	337
<i>caloneurum</i> Pittier . . . . .	316	<i>moritzianum</i> Klotzsch & Karsten . . . . .	318
<i>calycinum</i> Kunth . . . . .	333	<i>moritzii</i> Dunal . . . . .	337
<i>calycinum</i> var. <i>tenuiflorum</i> Francey . . . . .	334	<i>neblinense</i> D'Arcy & Benítez . . . . .	310
<i>calycosum</i> Pittier . . . . .	316	<i>neomiersianum</i> Benítez . . . . .	337
<i>cancellatum</i> Dunal . . . . .	334	<i>nocturnum</i> L. . . . .	277, 312
<i>chaculanum</i> Loes. . . . .	285	<i>odontospermum</i> Jacq. . . . .	292
<i>chloranthum</i> Dunal . . . . .	300	<i>oliganthum</i> Dunal . . . . .	300
<i>clausenii</i> Dunal . . . . .	306	<i>oliganthum</i> var. <i>latifolium</i> Dunal . . . . .	300
<i>confertum</i> Miller . . . . .	281, 283	<i>olivaceum</i> Francey . . . . .	314
<i>costanensis</i> Steyerf. . . . .	304	<i>ovatum</i> Roem. & Schult. . . . .	300
<i>cuneatum</i> Francey . . . . .	289	<i>panamense</i> Standl. . . . .	320
<i>cuneifolium</i> Francey . . . . .	290, 298	<i>paniculatum</i> Kunth . . . . .	327
<i>densiflorum</i> Francey . . . . .	337	<i>pariense</i> Steyerf. . . . .	314
<i>densiflorum</i> var. <i>puberulum</i> Francey . . . . .	337	<i>parqui</i> L'Her. . . . .	277
<i>depauperatum</i> Dunal . . . . .	281	<i>parvifolium</i> var. <i>venezuelense</i> Francey . . . . .	289
<i>diasae</i> Pittier . . . . .	337	<i>parvifolium</i> Willd. . . . .	289
<i>diurnum</i> L. . . . .	290	<i>paucinerviium</i> Francey . . . . .	285
<i>diurnum</i> var. <i>fastigiatum</i> (Jacq.) Stehlé . . . . .	292	<i>pedunculare</i> Dunal . . . . .	285
<i>diurnum</i> var. <i>odontospermum</i> (Jacq.) O. E. Schulz . . . . .	292	<i>pendulinum</i> Jacq. . . . .	281
<i>diurnum</i> var. <i>venenatum</i> (Mill.) O. E. Schulz . . . . .	292	<i>perilambanum</i> Loes. . . . .	329
<i>dubium</i> Pittier . . . . .	304	<i>petiolare</i> Kunth . . . . .	316
<i>fasciculatum</i> (Schltdl.) Miers . . . . .	277	<i>petiolaris</i> (Kunth) Spreng. . . . .	316
<i>fastigiatum</i> Jacq. . . . .	292	<i>poepigii</i> Sendtn. . . . .	300
<i>faucheri</i> Dunal . . . . .	306	<i>potalaeifolium</i> Dunal . . . . .	318
<i>floribundum</i> Britton . . . . .	323	<i>potatifolium</i> Dunal . . . . .	318
<i>glabrescens</i> (C. V. Morton) Steyerf. & Maguire . . . . .	294	<i>prieurei</i> Dunal . . . . .	300
<i>glabrum</i> Klotzsch & Karsten . . . . .	304	<i>pumilum</i> Francey . . . . .	287
<i>grande</i> Pittier . . . . .	320	<i>racemosum</i> Ruiz & Pav. . . . .	320
<i>hediundum</i> Lam. . . . .	277	<i>racemosum</i> var. <i>bolivianum</i> Francey . . . . .	320
<i>hirsutum</i> Jacq. . . . .	337	<i>racemosum</i> var. <i>grande</i> (Pittier) Francey . . . . .	320
<i>hirtum</i> Sendt. . . . .	300	<i>racemosum</i> var. <i>panamense</i> (Standl.) Francey . . . . .	320
<i>hirtum</i> Sw. . . . .	300	<i>reflexum</i> Sendtn. . . . .	323
<i>humboldtii</i> Francey . . . . .	294	<i>reflexum</i> var. <i>densiflorum</i> Francey . . . . .	323
<i>humboldtii</i> var. <i>calycinum</i> Francey . . . . .	296	<i>rojasianum</i> Hassl. . . . .	339
<i>humboldtii</i> var. <i>tenuiflorum</i> Francey . . . . .	296	<i>rugosa</i> Rusby . . . . .	334
<i>imbricatum</i> Rusby . . . . .	290, 298	<i>ruizteranianum</i> Bentez & D'Arcy . . . . .	325
<i>impersum</i> Rusby . . . . .	334, 335	<i>salicifolium</i> Jacq. . . . .	287, 325
		<i>salicifolium</i> var. <i>angustifolium</i> Dunal . . . . .	325
		<i>scandens</i> Vahl . . . . .	287, 327
		<i>scandens</i> var. <i>terminale</i> Dunal . . . . .	329
		<i>schulzianum</i> Francey . . . . .	331
		<i>schwenckii</i> Dammer . . . . .	308
		<i>sesseoides</i> Francey . . . . .	337
		<i>silvaticum</i> Francey . . . . .	310

<i>standleyi</i> Francey	310	<i>viridiflorum</i> Hook.	334
<i>strigilatum</i> Ruiz & Pav.	333	<i>Chiococca</i>	
<i>strigilatum</i> var. <i>calycinum</i> (Kunth) Kuntze	333	<i>alternifolia</i> L.	281
<i>strigilatum</i> var. <i>laxiflorum</i> Kuntze	334	<i>Habrothamnus</i> Endl.	273, 277, 285
<i>strigilatum</i> var. <i>tenuiflorum</i> Francey	334	<i>aurantiacum</i> Steudel	286
<i>suberosum</i> Jacq.	312	<i>Ixora</i>	
<i>tenuiflorum</i> Kunth	300	<i>alternifolia</i> Jacq.	281, 283
<i>tenuiflorum</i> var. <i>glabrescens</i> C. V. Morton	294	<i>Lomeria</i> Raf.	277
<i>tenuissimum</i> Francey	310	<i>Lomeria purpurea</i> Raf.	277
<i>terminale</i> (Dunal) Pittier	329	<i>Metternichia</i> Mikan	273
<i>tillettii</i> Benítez & D'Arcy	335	<i>Meyenia</i> Nees	277
<i>tinctorium</i> Jacq.	292	<i>fasciculata</i> Schldl.	277
<i>tomentosum</i> L. f.	296, 337	<i>Meyenia</i> Schldl.	277
<i>tovarense</i> Francey	318	<i>Parqui</i> Adans.	277
<i>tubulosum</i> Sendtn.	339	<i>Parquis</i> Raf.	277
<i>umbrosum</i> Francey	287	<i>Sessea</i> Ruiz & Pav.	341
<i>unibracteatum</i> Dunal	334	<i>atrovirens</i> (Dunal) B. D. Jacks.	341
<i>unibracteatum</i> var. <i>brachystachys</i> Dunal	334	<i>corymbiflora</i> Rich. Taylor & R. Phillips	341
<i>venenatum</i> Burm. f.	292	<i>corymbosa</i> Miers	341
<i>venenatum</i> Mill.	292	<i>stipulata</i> Ruiz & Pav.	341
<i>venezuelense</i> Francey	287	<i>Tsoala</i> Bossler & D'Arcy	273
<i>venosum</i> Roem. & Schult.	316	<i>Vestia</i> Willd.	273, 276, 277
<i>verbascifolium</i> Francey	337	<i>diurnum</i> var. <i>tinctorium</i> (Jacq.) M. Gómez	292
<i>respertinum</i> Griseb.	300	<i>Wadea</i>	
<i>respertinum</i> L.	281	<i>latifolia</i> Raf.	277
<i>respertinum</i> Lunan	292	<i>Wadea</i> Raf.	277